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22 distinguished surgeons have contributed to this Symposium, being headed up by Dr. Warren H. Cole, Professor and Head of the Department of Surgery, University of Illinois. These authorities present clinics on Gallbladder Disease, Treatment of Gastric Hemorrhage, Peptic Ulcer, Penetrating Wounds of the Abdomen, Appendicitis, Intestinal Obstruction, Peritonitis in Infancy and Childhood, Diverticulitis, Surgery of the Pancreas, Intussusception, Succinylsulfathiazole (Sulfasuxidine) and Elimination of the Mikulicz Operation, Foreign Bodies in the Peritoneum, Polyposis of the Colon, Surgical Treatment of Ulcerative Colitis, Tumors of the Stomach, Malignant Tumors of the Cardiac End of the Stomach and of the Terminal End of the Esophagus, etc., etc.

This Chicago number is truly a gem of surgical knowledge and technics—a number that subscribers will count among their choicest and most useful books.

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AN ARSENICAL WITH A BRILLIANT RECORD OF EFFECTIVENESS AND SAFETY

MAPHARSEN

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STUDIES ON TRAUMATIC SHOCK

III. ANESTHESIA IN CLINICAL SHOCK

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One of the most serious decisions to be made by the military surgeon is the choice of anesthesia for the wounded and shocked patient who must undergo abdominal surgery. Such wounded men more often than not have a seriously reduced circulating blood volume or have received blood or plasma insufficient in quantity to replace lost plasma or blood adequately. With front line casualties it is altogether likely that the supply of blood or plasma will never be great enough to restore to normal the blood volume of wounded personnel, so that the surgeon will be forced often to operate on persons in true or borderline shock. This will be especially true for patients whose shock is caused by continuing concealed "internal" hemorrhage.

A detailed discussion of the merits or disadvantages of the several anesthetic agents that might be used in shocked patients is considered not in order in this report. Certainly experience in World War I did not settle the arguments of the relative merits of chloroform, ether or nitrous oxide anesthesia for the shocked soldier. A careful review of the British medical literature on the subject of the choice of anesthesia in clinical shock reveals that since the invasion of the Low Countries in May 1940 and the evacuation at Dunkirk there has been a lack of agreement on one or several anesthetic agents for shock patients.

Evans and Beecher [1] in 1941 reinvestigated the gaseous anesthetic agents in experimental shock. We employed the shock preparation that I [2] developed, namely shock produced in the unanesthetized dog by strangulation of a short loop of ileum. In twelve to fourteen hours such animals show evidence of shock, and plasma losses by the dye technic of 25 to 40 per cent. We considered the shock to be caused principally by reduced circulating blood volume. To these animals in shock was then administered ether, nitrous oxide, ethylene or cyclopropane; a surgical plane of anesthesia was maintained until the animal died. No other shock factor, such as operation or further blood loss, was introduced into these experiments.

The results of such experiments indicated that, of the four gaseous anesthetic agents studied, cyclopropane or ethylene seemed to be the anesthetic agents of choice for shock individuals. The performance of shocked dogs under nitrous oxide was extremely poor (we thought anoxia and possibly vasodilatation was the cause), and the performance under ether was relatively much poorer than with either cyclopropane or ethylene. These studies formed the basis for Beecher's [3] recommendation that "these two agents, if available, should, on the basis of present information, be ranked as first choice" for abdominal exploration of a patient in shock or approaching shock.

Recently in this laboratory we have investigated further this problem in well over a hundred experiments and have now included in these studies chloroform and intravenous sodium pentothal. Data so far secured indicate that if no operative procedure is carried out on the shocked animal while it is under the influence of the anesthetic agent, and the shock is produced by either severe muscle trauma or intestinal strangulation, cyclopropane performs admirably but is not superior to carefully administered intravenous sodium pentothal, even though the experiment is carried on as long as four to six hours. If resection of the strangulated loop is performed, cyclopropane appears to be superior to intravenous sodium pentothal.

Correspondence and discussion with interested service medical personnel indicated that by no stretch of the imagination would front line conditions permit the use of cyclopropane, so our first clinical search for a safe anesthetic in shock excluded this excellent agent, simply on the basis of impracticability.

The current literature is replete with suggestions of the value of intravenous pentothal for the shocked patient. There has been little published evidence to support these suggestions. Since we were given to believe that battle conditions might require the use of such an agent, our initial clinical observations in a search for a useful, safe anesthetic in shock employed sodium pentothal. The first few patients operated on had suffered a recent perforation of a peptic ulcer. We quickly learned that for such intra-abdominal operations pentothal alone was an unsafe and poorly chosen anesthetic agent, simply because one cannot secure any reasonable relaxation of the abdominal musculature without the use of very unsafe concentrations of the drug. We were unable to examine peritoneal contents satisfactorily or close an abdomen satisfactorily if pentothal alone was used.

From the Department of Surgery, Medical College of Virginia, Richmond, Va.

Dr. I. A. Bigger, chief of surgical service, Medical College of Virginia, gave wholehearted support to this clinical study. Dr. M. J. Hoover assisted in the plasma volume studies.

This study was conducted under a contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and the Medical College of Virginia. It was initiated by a grant from the Committee on Scientific Research of the American Medical Association.

1. Evans, E. I., and Beecher, H. K.: The Relation of Anesthesia to Shock, unpublished data.
2. Evans, E. I.: Ann. Surg. **117**: 28, 1943.
3. Beecher, H. K.: Choice of Anesthesia for Seriously Wounded Patients, J. A. M. A. **121**: 899 (March 20) 1943.

Previously, in poor risk cases not in shock I had used bilateral intercostal nerve block as outlined by Bartlett [4] for anesthesia in abdominal explorations. This method possessed distinct advantages for poor risk cases, its only drawback being that if the surgeon was forced to manipulate the bowel very much the patient complained; unless a nitrous oxide analgesia was employed as an adjunct, it was usually impossible to proceed with the operation.

For shock cases in which much intra-abdominal manipulation must be done, bilateral intercostal nerve block must be combined with some other anesthetic method to insure success. This other method may be nitrous oxide anesthesia; I believe its use is ill advised in shock because of the relative anoxic state usually produced; also the equipment for its administration may not be readily available. The other method may be splanchnic block with procaine hydrochloride. The chief disadvantage to splanchnic block in military surgery is the precise training required so that the results will be adequate; then, most surgeons seem to require an unconscious patient.

In sodium pentothal we possess an agent that is useful in blocking the perception of pain produced by the pull on the mesenteric root. Observations on its effect in shocked patients undergoing abdominal surgery when used in conjunction with bilateral intercostal nerve block would give us information on the value of sodium pentothal in shock patients undergoing surgery of the extremities, when it might be used as the sole anesthetic agent, since relaxation would not be required.

In this report, therefore, I am presenting clinical evidence on the value of a combined anesthetic method for use in shock: the intercostal nerve block is used to insure relaxation of abdominal musculature for adequate exposure and proper closure; the pentothal is used to obviate splanchnic block or an inhalation anesthetic agent to produce unconsciousness. Every effort has been made to approach the problem from the practical point of view forced on the military surgeon, i. e. simple apparatus, oxygen was usually not given, selection of cases similar to those seen in a military campaign, no attempt to restore circulating blood volume by the preoperative administration of blood or plasma.

CLINICAL OBSERVATIONS

This report is based on the use of this combined anesthetic method on 45 patients in clinical shock on whom abdominal exploration was undertaken because of perforating stab or gunshot wounds of the abdomen or ruptured viscus from external trauma. To these are added observations on the use of sodium pentothal alone in 23 cases of skeletal injury (compound fractures of femur or tibia).

It is emphasized that these observations are enhanced by a knowledge of the actual plasma volume level in all these patients before the anesthetic was given. I am able to state that these shock patients represent a group who have suffered, in the main, a serious reduction of circulating blood volume. We have been conducting, therefore, a clinical study of the effect of sodium pentothal on patients in shock because of a reduced blood volume.

For purposes of illustration of the results to be obtained in clinical shock where sodium pentothal anesthesia may be used, 6 cases are briefly discussed; clinical findings, a condensed operative report and the anesthetic chart will be given for each case. The results obtained in the illustrated cases represent fairly, I believe, those obtained in the entire series.

THE METHOD OF INTERCOSTAL NERVE BLOCK

As far as I can find, this method was first described by Bartlett [4] in 1940. Considerable detail is given here as to the anatomy and technic of intercostal nerve block, because if attention is not paid to certain important matters poor results usually follow.

Anatomy (from Bartlett).—The intercostal nerves pass forward in the intercostal spaces below the intercostal vessels. At the back of the chest they lie between the pleura and posterior intercostal membranes but soon pierce the latter and run between the two intercostal muscles as far as the middle of the rib. They then enter the substance of the internal intercostals and run amid their fibers as far as the costal cartilages. The 7th, 8th, 9th, 10th and 11th intercostal nerves then pass behind the costal cartilages and between the internal oblique and transversus abdominis to reach the sheath of the rectus abdominis, which they perforate. They supply the rectus abdominis and end as the anterior cutaneous branches of the abdomen; they supply the intercostal and abdominal muscles. About the middle of their course they give off lateral cutaneous branches. These pierce the external intercostal and the external abdominal oblique muscles and divide into anterior and posterior branches, which distribute to the skin of the abdomen and back; the anterior branches supply the digitations of the external abdominal oblique and extend forward and downward nearly as far as the margin of the rectus abdominis; the posterior branches pass backward to supply the skin over the latissimus dorsi.

Technic of Anesthesia.—It is hard to lay down hard and fast rules for the estimation of proper premedication for a patient in shock. In general we have not been impressed that the premedication dosage of morphine or barbiturates should be lowered appreciably for a patient in shock. The average shock patient is given morphine 1/6 or 1/4 grain (0.010 to 0.016 Gm.), phenobarbital sodium 3 grains (0.2 Gm.) as a basal anesthetic and importantly to aid in prevention of the toxic effect of the procaine, and atropine 1/100 grain (0.00065 Gm.). This medication is given about thirty to forty minutes before the operation is scheduled to start.

After the patient is carefully placed on the operating table, both arms are abducted and placed on arm boards. The skin is prepared with mercresin (a surgical germicide) on either side from above the nipple line to the pubis and to beyond each midaxillary line.

We have employed 1 per cent procaine hydrochloride solution containing 2 minims of epinephrine to the ounce. This has given us sufficient duration of anesthesia for operations lasting up to one and one-half to two hours. If longer surgical procedures are contemplated, 2 per cent procaine solution could be used.

The 7th, 8th, 9th, 10th and 11th nerves are blocked in the midaxillary line starting from the uppermost one and working downward (fig. 1). It is very important that the injections be made in the midaxillary line, because the intercostal nerves lie at the lower border of the rib and between the two intercostal muscles at this point. Also it is at this point where the nerve is most easily accessible and where the lateral cutaneous

4. Bartlett, R. W.: Surg., Gynec. & Obst. **71**: 194, 1940.

branch of the nerve supplying most of the external abdominal oblique muscle will be included in the block.

The series of wheals of procaine are placed in the skin immediately below the inferior margin of the selected ribs with a 26 gage needle on a 1 cc. syringe.

Fig. 1.—Diagram illustrating the points of injection for intercostal block anesthesia. A series of skin wheals are made with 1 per cent procaine-epinephrine solution immediately beneath each designated rib in the midaxillary line. The neurovascular compartment is reached with the needle tip (fig. 2) by pushing the needle just under the rib edge. Five cc. of procaine solution is introduced into each neurovascular compartment.

Then with a 10 cc. syringe and a 19 or 20 gage 1½ inch needle the intercostal nerves are anesthetized by pushing the needle through skin, fat and fascia of the external intercostal muscle. The needle is allowed to slip slowly under the inferior margin of each rib (fig. 2). The nerve and vessels lie in a small compartment between the two intercostal muscles just adjacent to the inferior margin of each rib. Care is then taken to insure that the needle point is not in the pleural cavity or in a blood vessel by careful attempts to withdraw the plunger. When this is ascertained, 5 cc. of 1 per cent procaine-epinephrine solution is injected slowly into each space selected.

The surgeon and his first assistant should each do a side simultaneously; about five minutes is required for the procedure. The anesthetist then starts an intravenous infusion of saline solution into an arm vein, using a setup which will allow for the intermittent injection of pentothal (2.5 per cent). Ten minutes is allowed for the nerve block to become effective, during which time the operating team can scrub.

The skin is prepared again, and sterile drapes and towels are applied. We have usually anesthetized the line of incision in the skin with 1 per cent procaine-epinephrine solution. Subcostal, paramedian, rectus and transverse incisions have been used with the procedure outlined. At the time the skin incision zone is being anesthetized locally the anesthetist starts the pentothal anesthesia. The surgeon does not make his incision until the anesthetist is well under way with this procedure because in the shock state, to prevent fatality, pentothal must be given slowly and wisely. The patient is usually asked to count aloud during pentothal induction. The rate and depth of respiration must be watched closely and are the best signs for following the course of the shocked patient under pentothal anesthesia. Once pentothal anesthesia is well induced, the surgeon may start the operation.

If the intercostal nerve block has been done properly the patient will be excellently relaxed. More pentothal is given as needed. It has been found important that a steady, uniform level of anesthesia be maintained, because if the patient wakes and strains during the surgical procedure the surgeon may have some difficulty in handling intestines and proceeding with the operation. Further, when the pentothal anesthesia becomes too light the blood pressure in the shock patient tends to fall rather than rise. The pentothal is continued throughout the whole surgical procedure until the surgeon has closed the peritoneum and posterior rectus sheath.

Oxygen may be given by face mask during the pentothal anesthesia and, if available, possibly tends to prevent the further development of shock. In most cases we have not administered oxygen because we believed observations on the effect of this combined anesthetic method without oxygen therapy would more closely parallel battle conditions.

If it is found that the patient seems to be requiring a large amount of pentothal, we have given intravenously morphine ⅙ grain and have found that this cuts down greatly on the amount of pentothal needed to maintain an adequate anesthetic level.

As to the amount of 2.5 per cent pentothal solution required for induction in the shock patient, in general the amount required seems to be about 50 per cent of

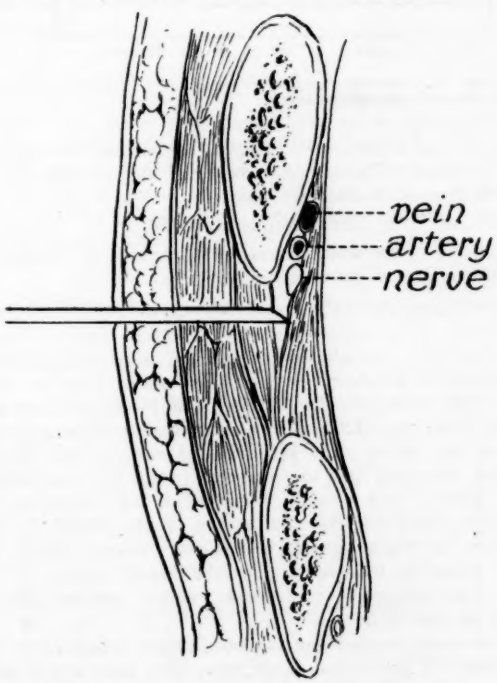

Fig. 2.—Position of needle tip.

that needed for induction in a patient with normal plasma volume. Often only 4 to 5 cc. will carry a patient to a level of adequate anesthesia. Then, too, several shock patients have needed very little pentothal for the entire procedure. The lesson here probably is that pentothal is a very potent anesthetic drug and must be used sparingly and cautiously in the shocked patient.

CLINICAL REPORTS

CASE 1.—J. M., a Negro aged 43.

Diagnosis: *Stab wound of abdomen, severance of 11th right intercostal artery; secondary shock.*

Operation: *Exploration of abdomen; repairing laceration of peritoneum; ligation of 11th intercostal artery, right; complete examination of abdominal organs.*

The patient had been stabbed in the right upper abdomen in the midaxillary line with a butcher knife. On admission there was cold perspiration on his forehead and hands, blood pressure 105/70, pulse rate 96, excellent venous filling time. Examination of the abdomen showed spasm throughout; examination of the abdominal wound with the gloved finger revealed that the butcher knife had entered the 11th intercostal space and cut the 11th rib in two. No preoperative treatment was administered. Blood pressure and pulse remained the same. However, when the patient was taken to the operating room the pressure dropped to 80/60 and the pulse rose to 100 with good volume.

Bilateral intercostal block was done and the patient operated on under intravenous pentothal anesthesia. A right transverse incision was used; 850 cc. of blood was aspirated from the peritoneal cavity and approximately 500 cc. of blood clot also removed. The laceration of the peritoneum was repaired with ligation of the 11th intercostal artery. Complete examination of all the small bowel, ascending colon and hepatic flexure was done. No lacerations of the bowel were found.

During the operation the patient received no blood. Plasma volume at the time of operation by the Gregersen method

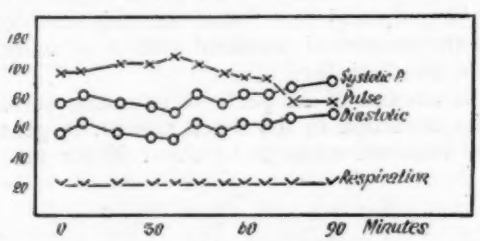

Fig. 3 (case 1).—Anesthesia chart (intercostal block-pentothal) in stab wound of abdomen, secondary shock.

was 30.3 cc. per kilogram.[5] Figure 3 illustrates the patient's anesthetic record. Relaxation was excellent, examination of bowel and closure of abdomen easy.

CASE 2.—M. J., a Negro woman aged 50.

Diagnosis: *Fractured pelvis; perforation of bladder, with peritoneal extravasation of urine.*

Operation: *Exploratory laparotomy; suprapubic cystotomy.*

The patient was brought to the hospital after being injured in an automobile accident. Examination showed her to have moderate tenderness over the pelvis. The blood pressure was 80/40, the pulse rate 120. X-ray examination showed severe fracture of the pelvis. The bladder was catheterized, bloody urine being obtained, but the resident noted that the return from the bladder was exactly the amount introduced, so he inferred that there was no perforation of the bladder. The patient was watched closely for sixteen hours, when she developed moderate tenderness over the lower portion of the abdomen. A cystogram was made, which demonstrated a small leak in the bladder.

Operation was carried out about twenty hours after the injury. Bilateral intercostal block was done, with added anesthetization of the 12th nerve bilaterally. The blood pressure at the start of the operation was 100/70, the pulse rate 135, with very poor volume. Exploratory laparotomy showed a considerable amount of urine-like fluid in the peritoneal cavity, but no perforation could be found. The peritoneum was closed and the bladder examined directly. No free perforation was found. Suprapubic cystotomy was done, and the patient did quite well for eighteen hours, the pressure then falling to 85/50. Signs of severe secondary shock appeared and she died. Postmortem examination showed a small perforation of the bladder and a perforation of the stomach into the lesser peritoneal sac. She was operated on under bilateral nerve block and intravenous pentothal (fig. 4). It will be seen that a very good response was obtained with this type of anesthesia in this very bad risk patient, who at the time was suffering from secondary shock due to trauma and early peritonitis.

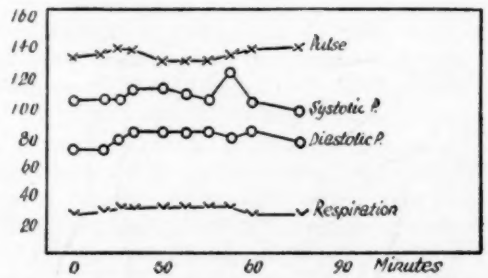

Fig. 4 (case 2).—Anesthesia chart (intestinal block-pentothal) in exploratory laparotomy in ruptured bladder, secondary shock.

CASE 3.—A. M., a Negro aged 24.

Diagnosis: *Traumatic rupture of jejunum at the ligament of Treitz; severance of right gastric artery; traumatic laceration right lobe of liver; generalized peritonitis; secondary shock.*

Operation: *Exploratory laparotomy; repair of jejunum; ligation of right gastric artery.*

The patient entered the hospital twenty-eight hours after an automobile accident in which he was struck with an overhanging piece of lumber from a truck ahead of his car. On admission the pulse rate was 120, of very poor volume, the blood pressure 75/50. There was generalized abdominal rigidity and tenderness. The extremities were not cold, nor was there sweating. With no preoperative transfusion or fluids the patient was operated on under bilateral intercostal block with intravenous pentothal anesthesia. An initial dose of 2 cc. of 2.5 per cent pentothal gave complete narcosis. A total of 0.5 Gm. was used for the entire procedure. A right paramedian upper abdominal incision was made; 220 cc. of blood stained fluid was aspirated from the abdomen, the hemoglobin content of which was 23 per cent. A complete transverse tear of the jejunum at the ligament of Treitz and a severed right gastric artery were found. The jejunal rent was repaired and the artery ligated. There was a 4 inch laceration of the right lobe of the liver, which was repaired. Relaxation was excellent and the abdomen closed without any difficulty. Following the operation the patient was given two blood transfusions and did fairly well until his third postoperative day,

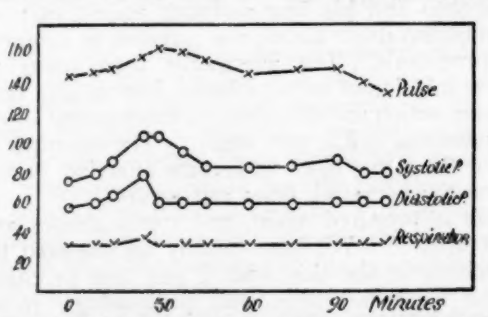

Fig. 5 (case 3).—Anesthesia chart (intercostal block-pentothal) in traumatic rupture of jejunum, severe shock.

after which he declined rapidly and died. Postmortem examination confirmed the operative findings.

A plasma volume determination by the Gregersen method at the time of operation revealed that the patient's plasma volume was 20.2 cc. of plasma per kilogram, so it is apparent that the man was in severe shock at the time of operation.

Figure 5 illustrates the anesthetic record of the patient.

5. We have accepted 45 cc. per kilogram as the normal figure for plasma volume for adults (Gregersen and our unpublished data).

CASE 4.—R. J., a Negro aged 39.

Diagnosis: *Stab wound of abdomen; stab wound of liver; hemorrhagic shock.*

Operation: *Exploratory laparotomy with suture of stab wound of liver.*

The patient was admitted to the hospital after having been stabbed in the left upper quadrant of the abdomen half an hour before admission. He had bled profusely; his clothes were covered with blood. Blood pressure on admission was 70/50, pulse rate 100, of extremely poor volume; the extremities were cold and dry; the temperature was 95.8 F. Examination revealed nothing noteworthy except a 1 cm. long stab wound just below the xiphoid process. It was inferred that the man had suffered a severe laceration of the liver with considerable blood loss. He was given 1,500 cc. of 5 per cent dextrose solution but in two hours his pressure had fallen to 50/35, where it remained two hours later. He was then given 500 cc. of blood, but this had very little effect on his general state. We were unable to improve his condition, so it was inferred that he was bleeding from either the liver or a large vessel in the abdomen. Operation was performed about twelve hours after admission. The plasma volume was 25 cc. per kilogram at the time of operation.

Bilateral intercostal block with intravenous pentothal was the anesthetic used. A right upper paramedian incision was employed. On entry into the abdomen 1,200 cc. of blood was aspirated from the abdominal cavity. There was a deep 4 inch laceration in the left lobe of the liver, which was closed

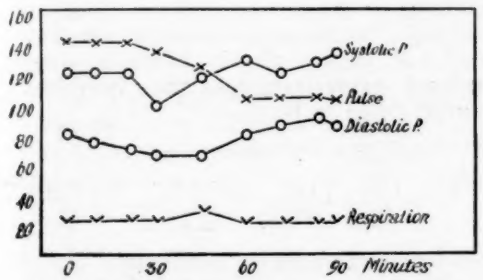

Fig. 6 (case 4).—Anesthesia chart (intercostal block-pentothal) in stab wound of abdomen, hemorrhagic shock.

only by plugging it with a large piece of omentum held in place by several fixation mattress sutures.

This anesthesia worked excellently with the patient and allowed for complete examination of the abdominal contents. The closure was exceedingly easy. Figure 6 illustrates the patient's anesthetic chart.

CASE 5.—J. T., a Negro aged 43.

Diagnosis: *Gunshot wound of left upper quadrant of abdomen; large perforation of splenic flexure of colon; secondary shock.*

Operation: *Exploratory laparotomy; closure of intestinal perforation; examination of abdominal organs.*

The patient was brought to the hospital about half an hour after having been shot with a 0.32 caliber bullet at close range. The bullet had entered the left upper quadrant of the abdomen at the anterior axillary line just below the 10th rib. There were no classic signs of shock, but there was an easily demonstrated slowing of the venous flow in both arms. The blood pressure was 140/100, the pulse rate 88, of fair volume. The plasma volume determined immediately before the operation showed him to have only 27 cc. of plasma per kilogram, with a hematocrit of 49. Other than the spastic abdomen the only findings of interest were that the x-ray plates showed the bullet to have lodged behind the first sacral vertebra within the spinal cord. Neurologic examination revealed the loss of motor power in the left leg.

Abdominal exploration was performed under bilateral intercostal block with intravenous pentothal. A left subcostal incision was used. On entry into the abdomen a large quantity of free blood was encountered. There was a 3½ inch hole in the splenic flexure of the colon, which was repaired by ordinary methods. No other perforation of the bowel was found after thorough examination. Closure was very easy. Figure 7 illustrates the anesthetic record of the patient, and it may be seen that the response to the type of anesthesia used was excellent. The patient had a very stormy postoperative course.

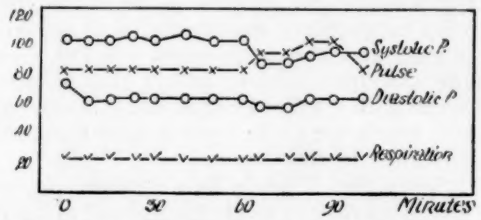

Fig. 7 (case 5).—Anesthesia chart (intercostal block-pentothal) in gunshot wound of abdomen, secondary shock.

Case 6 is included in this report because it illustrates the results that have been obtained uniformly with intravenous pentothal anesthesia in surgery of the extremities.

CASE 6.—The left leg of a Negro aged 26 had been run over by a freight train about one hour before admission, at which time the patient was very restless, the blood pressure 130/50 and the pulse rate 100, of good volume. There was good venous filling of the arm veins. The only clinical sign of shock presented on admission was the presence of profuse cold sweat on the forehead and extremities. The blood pressure on arrival in the operating room was found to be 70/50 and the pulse had become rapid and thready (rate 140).

Amputation of the left lower extremity above the knee was carried out under intravenous pentothal anesthesia. The blood pressure was unchanged during the main part of the procedure and actually rose toward the end. During the entire procedure the patient received about 600 cc. of isotonic solution of sodium chloride with the intravenous pentothal. The amputation was very easy to do under this anesthesia. Figure 8 illustrates the patient's record.

After the operation 500 cc. of blood was given. A plasma volume determination immediately prior to the operation showed that the patient had a plasma volume of only 28.9 cc. per kilogram, so it is evident that he was suffering from severe traumatic shock due to external loss of blood. Even in the presence of this severe shock, intravenous pentothal anesthesia seems to have worked very well.

COMMENT

In the foregoing pages evidence has been presented that intercostal nerve block combined with intravenous pentothal seems to be a safe and satisfactory anesthetic

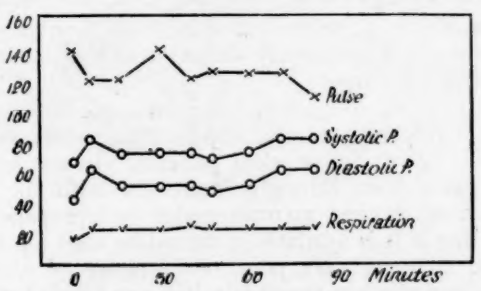

Fig. 8 (case 6).—Anesthesia chart (intravenous-pentothal); amputation of lower limb, severe shock.

for abdominal operations on patients in shock. The cases mentioned in this report were more or less comparable (as regards severity of shock, operative risk and extent of operation) to the whole group so far studied and doubtless represent as serious a type of operative risk as will be encountered in most military practice. To my mind the results gained so far speak for them-

selves. In no case in which death finally transpired was it felt that the anesthetic bore even the remotest relation to the cause of death. There have been no deaths on the operating table.

In our hands this type of anesthesia possesses most of the virtues of spinal anesthesia; complete relaxation is usually secured, the closure is rapid and there is opportunity for excellent approximation of the posterior rectus sheath and the peritoneum. I feel from my experience and from that of others that spinal anesthesia carries with it a tremendous risk to shock patients, which risk seems not to be present with the anesthetic method outlined in this report.

It is believed that it would be a very practical matter for the armed services to teach this method of anesthesia to operating teams who are to carry on the burden of front line surgery. The technic of injection is so simple that it could be taught within a few minutes to any one at all acquainted with the anatomy involved. Failure to obtain relaxation should be rare after even the first attempts. The time and equipment required for the administration of this anesthesia is essentially no more than that involved in giving a spinal anesthetic. In active front line surgery one member of the team could be preparing the next patient by intercostal nerve block as the operating team is finishing an operation.

In this report mention has not been made of the use of this anesthetic method in cases other than acute abdominal emergencies, but it may be of interest to note that this method of anesthesia has been used with success in a growing list of poor operative risks, including perforated peptic ulcers, explorations of the common duct, cholecystostomy, cholecystogastrostomy, biopsies of the liver and strangulation of the small bowel.

One of the chief disadvantages of sodium pentothal anesthesia for the shocked patient may be the slowness of recovery when it is used for a long operation. Occasionally I have noted in shocked patients in whom the combined intercostal block-intravenous pentothal anesthesia method was used that full recovery was delayed for ten to twelve hours. On full recovery they did not seem to have suffered from the lengthy anesthetic period, but in military practice, when rapid evacuation of operated patients is necessary, this slowness of recovery may prove a severe handicap in the handling of patients. Recovery has not been speeded up by the use of metrazol or picrotoxin.

Sodium pentothal with local procaine block has been employed for open chest surgery on several patients with apparently no deleterious effects, but I am strongly inclined not to use routinely sodium pentothal anesthesia for open chest surgery.

In this report no attempt has been made to state the relative safety of pentothal, cyclopropane or ether as anesthetic agents for shocked patients. In the laboratory I have been strongly impressed with the performance of shocked animals under cyclopropane and believe that if it is available it should be used for shock patients. The relative poor performance of shocked animals under ether anesthesia has not blinded me to the fact that for clinical use ether still remains the safest anesthetic agent in relatively unskilled hands. Until clinical studies now in progress on the effect of ether anesthesia in shock have been completed, I would prefer to reserve judgment as to the relative safety of ether versus pentothal when used in clinical shock. I would be emphatic in declaring that I believe these studies with pentothal and ether constitute a real test of anesthetic agents in shock because, even though serious wounds are present, anesthesia and operation have been deferred only long enough to permit us to estimate by dye methods the blood volume of each and every patient in the study.

In closing, I would be remiss in not sounding a warning as to the dangers of sodium pentothal anesthesia for surgery in shocked patients. Sodium pentothal is an extremely potent anesthetic agent; in the presence of shock only small doses may be required to anesthetize the patient fully. Its use should be delegated to qualified persons, not amateurs. It must not be used alone for abdominal surgery. During the induction period it must be given slowly and sparingly; the surgeon must not be allowed to "hurry" the anesthetist.

Even in the face of these warnings, my belief is that bilateral intercostal nerve block-intravenous sodium pentothal anesthesia will prove to be a valuable and safe anesthetic method for use in the shocked patient who must undergo abdominal surgery. For shocked persons requiring surgery to the extremities, sodium pentothal has proved to be an excellent and safe anesthetic agent.

SUMMARY

Bilateral intercostal nerve block of the 7th through the 11th intercostal nerves in the midaxillary line combined with intravenous sodium pentothal constitutes an apparently safe and satisfactory anesthesia for abdominal operations on patients in moderate or severe shock (45 patients). Intravenous sodium pentothal alone has been used with success also in 23 shock patients who have suffered severe trauma to the extremities where major surgery had to be done.

FAILURE OF THE SWEAT MECHANISM IN THE DESERT

THERMOGENIC ANHIDROSIS

CAPTAIN JULIUS WOLKIN
CAPTAIN JOSEPH I. GOODMAN
AND
CAPTAIN WILLIAM E. KELLEY
MEDICAL CORPS, ARMY OF THE UNITED STATES

Present day concepts of the effect of extreme heat on the human body have been associated with the terms heat stroke, heat exhaustion and heat cramps. We have had the opportunity to study a syndrome involving failure of the normal sweat mechanism in a group of soldiers affected variously by extreme heat. We believe this syndrome must be differentiated from heat stroke and heat exhaustion. As represented in textbooks the latter are generally described as follows: Heat stroke is characterized by collapse, delirium, irritability and visual disturbances. Nausea and vomiting may forewarn one of the impending attack. Often it occurs with dramatic suddenness. Significant physical findings in addition to the altered mental state include hot dry skin, elevation of body temperature (106-110 F.) rectally, rapidity of the pulse, with a rate of 160 to 180 per minute, and increased depth of respiration, which may simulate Kussmaul breathing.

Heat exhaustion is manifested by headache, loss of appetite, drowsiness, extreme weakness, visual disturbances, vomiting, vertigo and inability to walk. There may also be cramps of varying severity of the limb and abdominal muscles. Examination of the affected person reveals that the skin is cold and clammy

From the 97th Evacuation Hospital.

and wet with profuse perspiration. The mouth temperature is usually normal; the rectal temperature may be normal, subnormal or slightly elevated. The pupils are dilated, the pulse rate is increased and the blood pressure may be lowered.

Heat cramps are sufficiently clear not to complicate a differential diagnosis of heat disturbances. They are manifested by painful contracture of the voluntary muscles, more frequently of the extremities and abdominal wall.

Fig. 1.—Thermoregulatory (heat) sweating test. Note anhidrosis below level of neck and the compensatory hyperhidrosis above.

This report is based on a study of eight soldiers actively engaged in normal military training in the American desert area. Temperatures encountered here exert a profound effect on the body heat economy. As will be shown herein, this group of soldiers exposed to desert heat exhibited primarily a derangement of their sweating, producing a picture significantly different from presently accepted entities. The importance of sweating as a factor in regulation of the heat economy has clearly been brought out in the work of Hyndman and Wolkin.[1]

We observed that the cases studied did not conform clinically with either heat stroke or heat exhaustion. In general they all presented a typical history, viz. a rather sudden onset of generalized weakness, subjective warmth and discomfort, dizziness, "all-in" feeling, headache and shakiness. These symptoms occurred during exposure to sunlight, either with or without physical exertion.

The onset of these symptoms was associated with or preceded by a cessation of sweating in each case. This was in turn often preceded by a distinct period of profuse outpouring of sweat from a few days up to several weeks in duration. The loss of sweating was limited uniformly to the body region below the neck in pronounced contrast to the outpouring of sweat from the face and neck.

The objective findings were characterized most of all by a warm, dry skin from the neck down, whereas the face and neck showed profuse droplets of sweat. The skin of the entire body below the level of the neck had the appearance of goose flesh. However, this fine papular eruption did not appear and disappear in a matter of minutes like goose flesh. The papular eruption was diffuse and uniform, each papule being about the size of a large pinhead. In cases of longer standing there was a fine, branny desquamation. As the condition improved, the fine papular eruption disappeared and the skin resumed its normal appearance. In some cases the condition was recognized solely on the appearance of the skin.

The body temperature for the most part remained below 99 F. orally except on those occasions when the external environmental temperature reached heights of 120 F. or over. Under these conditions complaints of extreme feeling of heat, discomfort and irritability were offered.

In general, all of these cases promptly improved subjectively by the simple expedients of cool environment and rest.

In order to portray more clearly the disturbances of the sweat mechanism which were observed clinically, the starch-iodine method of Minor[2] was used. The iodine solution was applied to the skin and allowed to dry. Corn starch was then dusted on the body.

The normal sweat pattern in man in response to heat stimuli and cholinergic drugs has been previously described by List and Peet[3] and by Hyndman and Wolkin.[4] Similarly we have studied the sweating response to heat, pilocarpine and mecholyl chloride in these cases.

In normal persons sweating is initiated physiologically whenever the external temperature reaches a point at which the need for body heat dissipation exists. This is known as thermoregulatory sweating. In carrying out thermoregulatory or heat sweating tests on our patients, the nude body was subjected to the desert sun at temperatures exceeding 120 F. until the degree of sweating appeared to have reached a maximum. Hot tea and acetylsalicylic acid 10 grains (0.65 Gm.) before exposure were used to augment the sweat response.

Each of our 8 patients invariably showed pronounced hyperhidrosis of the face and neck. Below the neck the sweating response in all cases was almost entirely absent (fig. 1). In a few, isolated islands of sweat appeared over the abdomen and legs.

To produce cholinergic sweat response, we injected pilocarpine ¼ grain (0.016 Gm.) hypodermically. Later, mecholyl 25 mg. hypodermically was substituted.

Fig. 2.—Pilocarpine sweating test. Note distribution of sweat as in figure 1.

The response to cholinergic drugs (pilocarpine and mecholyl) paralleled in every case the response to heat (fig. 2), viz. almost complete anhidrosis below the

1. Hyndman, O. R., and Wolkin, Julius: The Autonomic Mechanism of Heat Conservation and Dissipation: I. Effects of Heating the Body; Evidence for the Existence of Capillary Dilator Nerves in Anterior Roots, Am. Heart J. **22**: 289-304, 1941.

2. Minor, V.: Ein neues Verfahren zu der klinischen Untersuchung der Schweissabsonderung, Deutsche Ztschr. f. Nervenh. **101**: 302-308, 1927.

3. List, C. F., and Peet, M. M.: Sweat Secretion in Man: I. Sweating Responses in Normal Persons, Arch. Neurol. & Psychiat. **39**: 1228-1237 (June) 1938.

4. Hyndman, O. R., and Wolkin, Julius: Sweat Mechanism in Man: Study of Distribution of Sweat Fibers from Sympathetic Ganglia, Spinal Roots, Spinal Cord and Common Carotid Artery, Arch. Neurol. & Psychiat. **45**: 446-467 (March) 1941; Pilocarpine Sweating Test: I. A Valid Indicator in Differentiation of Preganglionic and Postganglionic Sympathectomy, ibid. **45**: 992-1006 (June) 1941.

neck and hyperhidrosis above. For our purpose it is sufficient to emphasize that in a normal person this amount of mecholyl will induce profuse sweating over the entire body (fig. 5).

These patients were again subjected to the tests when it appeared clinically that normal sweat function had

Fig. 3.—Thermoregulatory (heat) sweating test. After recovery of sweat function.

returned. All the cases showed the normal sweat pattern in response to both heat and mecholyl (figs. 3 and 4).

REPORT OF CASES

Case 1.—W. B., aged 30, was admitted to the 97th Evacuation Hospital on Aug. 12, 1943 after ten months' service in the Army. Six days previously, while scrubbing pans in the sunlight, he became shaky and weak and developed a headache. He stated that his skin was dry below the neckline. This was associated with an inability to sweat over the torso and extremities. Rest in bed was followed by prompt relief of all the subjective symptoms. After three days in bed at his battalion aid station and another three days in his own tent he returned to duty, but the symptoms promptly reappeared. On admission he appeared well. Most prominent was the appearance of the skin below the neckline. It was dry and scaly with a mottled appearance from tiny white prominences, reminding one of goose pimples. During his hospital stay he felt very well at night and in the morning. In the afternoon as the external temperature of the tent increased (as high as 120 F.) he became very hot and uncomfortable. His oral temperature on some occasions would rise to 100 or 101 F. Although there was no perceptible sweating in the remainder of the body, the head and neck perspired more profusely than normal. When his body was

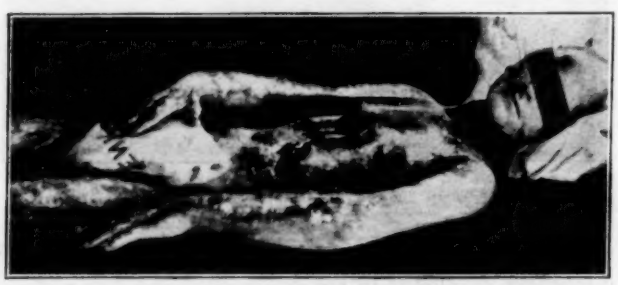

Fig. 4.—Pilocarpine sweating test. After recovery of sweat function.

cooled by wet sheets or by removal to an air conditioned van, there ensued a prompt reduction of temperature and disappearance of his headache.

Case 2.—This soldier came from Louisiana to the desert on June 15, 1943. He felt very well in Louisiana, as well as in Mississippi prior to that. Between June 15 and August 8 he was quite well except in the afternoons, when he experienced a feeling of "passing out," i. e. he became faint and complained of his head "whirling." On August 10 he walked about 2½ miles in bright sunlight. He thought of falling out of the column but remained with his company and rode back to camp in a truck. That evening he had no further complaints. On the morning of August 11 no untoward symptoms developed during lectures, close order drill and calisthenics. After his noon hour meal he again experienced a feeling of "passing out"; hence he slept until 2 o'clock. On awakening, his legs seemed heavy and his head ached. During a mile walk to classes, his underclothes were soaked around the chest and waistline. Classes continued in the shade until 5 o'clock. On the walk back to quarters he felt "all in." He reported to the aid station, where he was treated by ice sheet applications and given ice water to drink. At the clearing station that night he received intravenous fluids and was subsequently admitted to the 97th Evacuation Hospital. On admission he had no definite complaints. After several days in the hospital he noticed that the skin of his arms and legs was dry and scaling. Then he realized that he was not sweating, though his face and neck perspired profusely. He was unaware of the abnormal sweating condition until questioned, when he recalled that the skin of his arms and legs had been dry for some time. He was certain that he sweated normally prior to June 15, 1943. On August 23 his temperature rose from 98.6 F. to 99.4 F. (orally) after one-half hour exposure to the sun. As a result of this exposure he became nervous and "dizzy." Sweating below the neck had not returned up to the time of his evacuation (fourteen hospital days).

Case 3.—R. A., aged 22, was admitted to the 97th Evacuation Hospital on Sept. 6, 1943 with the following story: On August 26, while on a 2 mile hike, he complained of an "all in"

Fig. 5.—Normal sweat response to mecholyl by normal person.

feeling. Previously he had easily negotiated distances of 20 to 25 miles. Despite a two hour rest period he continued to note this "all in" sensation on the return trip. He complained of extreme heat and barely completed the distance. Sweating had ceased except for profuse perspiration of the head and neck. He remained on duty and took four to five salt tablets a day on medical advice. However, his symptoms continued despite the salt. On August 27, during a 1 mile walk, he "burned up all over" and had to be carried back in a jeep. He noticed some improvement after a cool shower. Afterward he had felt well in the morning and very tired in the afternoon even on light duties. He was referred to this hospital twelve days later because of failure of adequate salt intake to improve his symptoms. He had noted extreme hyperhidrosis for a period of weeks preceding the onset of symptoms.

Sweating tests performed on September 6 and September 8 showed decidedly diminished sweating below the neck, but on September 17 and September 18, as shown by similar tests there was almost complete recovery.

Case 4.—F. N., aged 19, was admitted to the 97th Evacuation Hospital on Sept. 6, 1943, stating that on September 5, while engaged in greasing vehicles (which he had done many times previously), he suddenly became light headed and extremely weak. For two or three days preceding, he had been feeling tired and had complained of being hot all over. He had noted a disappearance of sweating, except on the face and

neck, the morning of September 5. He had always been a profuse sweater prior to this episode. Within three hours after hospitalization his weakness had disappeared with no specific treatment other than rest in the shade.

On September 8 sweating tests showed pronounced hypohidrosis below the neck. Similar sweating tests performed on September 18 showed the recovery of sweating.

CASE 5.—R. L., aged 34, was admitted to the 97th Evacuation Hospital on Sept. 6, 1943. Beginning on August 21, he developed miliaria over his entire body except the face and neck. Within the succeeding three days he noted the disappearance of sweating over the arms, legs and sides of the torso. On August 31, while erecting a tent, he became light headed and lay down on the tent floor. He improved when cold water was poured on him. Afterward, whenever exposed to the sun, he sensed a similar occurrence. Despite the excessive dryness of his skin elsewhere, there was more than normal perspiration of the face and neck.

Heat tests and mecholyl injection on September 8 revealed diminished sweating below the neck. There was complete recovery of sweating function on repetition of the same tests on September 17 and September 18.

CASE 6.—B. R., aged 18, was admitted to the 97th Evacuation Hospital on Sept. 6, 1943 complaining that he became very hot and "dizzy" the day before while on the firing range. That morning he was nauseated and had noted a cessation of sweating. He was admitted with a diagnosis of heat exhaustion. The temperature was 102 F. rectally. He was given ice packs at the clearing station and 2,000 cc. of 5 per cent dextrose in isotonic solution of sodium chloride at this hospital. Within six hours his temperature dropped to normal, where it remained. His sweating function had returned to normal within twenty-four hours.

Six weeks prior to this episode he suffered a similar attack consisting of loss of sweating, nausea, vomiting and dizziness. He recuperated promptly, and the sweating function returned within nine to ten hours. No sweating tests could be done because of prompt recovery.

CASE 7.—I. R., aged 20, admitted to the 97th Evacuation Hospital on Sept. 15, 1943, related the following story: On arrival on the desert, June 18, he engaged in heavy manual work, causing perspiration "to pour off him in buckets." On August 18 he was transferred elsewhere in the desert. At this time he had noted that his sweating gradually had disappeared except around the head and neck, where sweating was profuse. Interestingly enough, his work in the new area was much less strenuous. On September 8 he traveled six hours across the desert in a jeep. On his return he felt light headed. He walked to his tent, where he lost consciousness for a few seconds. Medical aid was given along the lines of treatment advised for heat exhaustion, viz. blankets, elevation of the feet and salt. On September 10 at reveille he sensed a feeling of "pins and needles" all over and weakness in the use of his arms and legs. He was given salt pills in the dispensary but was referred to our hospital on September 14 because the symptoms persisted.

Sweating tests on September 17 revealed diminished sweating below the head and neck.

CASE 8.—V. V., aged 28, who was admitted to the 97th Evacuation Hospital on Sept. 17, 1943, had been on the desert for three months and had never had any previous difficulty in hiking. He described sweating of such a degree as to simulate water "coming out of a hose." On September 16 during a hike he felt as though he were "burning up." Others whose jackets were wringing wet inquired "How does it happen you are not wet like we are?" He was admitted to our hospital after a short episode of unconsciousness. The receiving officer noticed the association of unconsciousness with a dry hot skin and suspected a heat stroke but was surprised to find a rectal temperature of only 99 F. The patient responded quickly to the local application of ice and regained consciousness in fifteen to twenty minutes, at which time he was not conscious of sweating anywhere.

Our sweating tests of September 17 revealed pronounced diminution in sweating, most prominent below the head and neck.

COMMENT

A careful analysis of the case reports discloses certain features which serve to set apart this syndrome from heat stroke and heat exhaustion. We agree that at first glance one might conceivably mistake such cases for heat stroke, especially if seen during transient periods of unconsciousness (see case 8). Furthermore, the dry hot skin universally present in heat stroke and strikingly present below the neck in this group of cases might be a confusing feature. The similarity, however, ends here, for the well known hyperpyrexia, coma, elevated pulse rate and increased respiratory rate of heat stroke are conspicuously absent in our group.

There are perhaps more grounds for possible confusion with heat exhaustion. The headache, generalized extreme weakness and vertigo in our cases are likewise present in heat exhaustion; however, the cold clammy skin and signs of shock, which are integral components of heat exhaustion, are invariably absent in the syndrome under discussion.

Among the admissions to the 97th Evacuation Hospital for the period from July 21 to Sept. 23, 1943 there were 77 patients with some form of heat disorder. Of these there were 3 unquestioned heat strokes, having a characteristic hyperthermia (107 to 110 F.). The remaining 74 patients were admitted for the most part with the diagnosis "Heat, ill defined effects of." Unfortunately many of these cases had been evacuated prior to the recognition of this syndrome. Nevertheless we were able to uncover 8 cases but feel certain that many similar to these described were present in the group as a whole, since we had relatively little difficulty in discerning such cases among our most recent admissions. In retrospect it is noteworthy that relatively few of the 77 cases could satisfactorily be classified as heat exhaustion.

The Role of Salt.—The early work of Haldane on chloride loss through excessive perspiration in laborers subjected to extreme heat has universally been accepted as sufficient explanation for the symptomatology of heat exhaustion.

In this regard it should be pointed out that all of our cases were originally seen and treated in battalion aid, collecting and clearing stations. All were given some form of salt therapy, 4 to 6 grams daily as oral tablets, in addition to using drinking water fortified with salt in a 0.1 per cent solution. Only after failure of the regimen to affect their symptoms were these patients transferred to our hospital. On the other hand we have observed that merely the removal of these patients from excessive heat and relief from duty served to allay the symptoms rapidly. On trial exposure to sunlight during hospitalization their initial symptoms returned. (See case reports.)

After recovery of the sweating function, however, the symptoms could not be provoked even when the patient was again temporarily subjected to excessive heat of the desert sun. This demonstrates that the presence or absence of normal sweating function is the determining factor in the production of this syndrome, while the intake and excretion of salt apparently play an insignificant part.

Further support for this view is lent by the laboratory data gathered on 20 of the 77 patients by Captain Louis

Rosenbaum [5] at the time of their admission to this hospital. There was no deviation from the normal blood chloride level in any instance of heat stroke or in any of the less well defined cases of heat exposure, which Captain Rosenbaum chose to regard as heat exhaustion for want of a better term. Four of the cases in this paper are included in his data.

We believe, then, that our group should not be regarded as heat exhaustion for the following reasons: 1. The clinical course of the observed syndrome is one of decreased sweating frequently following an initial temporary period of hyperhidrosis. Interestingly enough, the symptoms appear to start with the cessation of sweating. 2. The soldiers develop and retain their symptoms despite doses of salt intake prescribed to prevent just such an occurrence. 3. The small amount of laboratory evidence available indicates no deviation from the normal blood chloride concentration.

Role of the Thermoregulatory Mechanism.—Sweat glands are controlled solely by the thoracolumbar or sympathetic division of the autonomic nervous system. However, many investigators have demonstrated that there are two types of fibers in the sympathetic system, and it is now generally accepted that two types do exist, viz. cholinergic and adrenergic fibers. Sweat gland activity is definitely a cholinergic response.

As far as its thermoregulatory control is concerned, the response of the skin to changes in external temperature is characteristic. Thus, in conserving heat there is vasoconstriction of the skin vessels, absence of sweating and pilomotor activity, whereas in dissipation of heat there is vasodilatation of the skin vessels, sweating and absence of pilomotor activity. Under conditions of extreme heat, such as one encounters in the desert, the normal reaction of the body is integrated toward a purposeful end, namely heat dissipation. One of the important effects of this reaction is the onset of sweating; hence it is readily seen how any alteration of sweating response would profoundly affect the ability of the body to dissipate heat. We have seen described herein the type of clinical picture which results from such a dysfunction.

In attempting to analyze the pathophysiology which may underlie such a failure of the sweat apparatus, two possible sites of involvement are to be considered: (1) central—thermoregulatory center in the hypothalamus; (2) peripheral—the nerve endings or sweat glands. As far as the central site is concerned, the retention of sweating of the face and neck would seem to militate against localization of the disturbance of the thermoregulatory center. It is difficult to postulate a central lesion, functional or organic, acting in such a manner as to spare the face and neck consistently. Again, in the hyperthermia following cerebral operative procedures in which a lesion of the thermoregulatory center exists the resulting anhidrosis invariably involves the entire body. Similarly in the hyperthermia of heat stroke and thyroid crises we have observed complete anhidrosis. Evidence that the face and neck have a thermoregulatory control center distinct from the rest of the body is lacking.

The possible role of the end organ apparatus and the sweat glands themselves merits some discussion. It appears unlikely that the intrinsic function of the sweat glands can be altered. Previous work of Hyndman and Wolkin [6] had shown that the sweat glands are capable of functioning several years after complete sympathetic denervation. This is evidenced by contact sweating.[7]

It would appear from consistent failure of the peripherally acting cholinergic drugs to invoke their normal response in our patients that the end organs are the site of involvement. Yet this explanation cannot be sustained in view of the following fact: Pilocarpine and mecholyl fail to produce a peripheral stimulation of sweating even in the presence of known central damage, viz. postoperative cerebral hyperthermia, heat stroke and thyroid crisis. Such a lack of response to the cholinergic drugs may be viewed as an active central inhibition strong enough to counteract the effect of the drugs.

Returning to the clinical picture, several significant features stand out: 1. The frequent occurrence of a transient period of hyperhidrosis. 2. The sudden subsequent hypohidrosis coincident with the production of the clinical syndrome. 3. The relatively rapid recovery of normal function. This sequence of events raises the question whether the initial hyperhidrosis could be thought of as an overtaxing of the thermoregulatory mechanism to the extent of producing a temporary functional "paralysis."

CONCLUSIONS

The syndrome of failure of the sweat mechanism in the desert which we have described stands out clearly from the hitherto accepted concepts which identify only heat stroke, heat exhaustion and heat cramps. The early recognition of the syndrome is of paramount importance, since its proper management demands immediate removal from excessive heat. Often there has been a tendency to regard this group as merely forms of heat exhaustion and to return these soldiers to duty with only the admonition to continue oral salt intake. Salt is not indicated and we believe of no value.

We cannot stress too much that these patients require avoidance of exposure to excessive heat until the sweat function has returned to normal. Even after recovery we are inclined to oppose their return to similar climatic conditions.

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5. Rosenbaum, Louis: Personal communication to the authors.
6. Footnote 4, first reference.

7. If two skin surfaces are brought in contact even after complete sympathectomy, sweating will be produced along the contact areas.

Relations of the State to the Scientist.—The lowly and junior profession of medicine, unlike its proud and elder sisters, has had no direct part and no direct influence in the work of government. It has therefore had to submit to its duties being piled up as occasion arose, with no resource for securing a due compensation of privilege and immunity except such slender sense of natural justice as governments possess and their occasional doubts about the prudence of overloading a willing beast. These resources have shown all the ineffectiveness we might have expected. The result is that, at a time when it is no longer possible to conceal the wholly unique importance of medicine for the very existence of social life, that profession finds itself of all professions the least in command of social prestige, the least privileged, the most exposed and the hardest worked. I do not mention this state of affairs because I think it is to be deplored. I do not think it is to be deplored. The evolutionary cause that has put the profession of medicine where it is may not be the one that would have been pursued by conscious wisdom, but it has had the result of putting medicine in the very small class of professions that, in this tame world, can still be called jobs for men.—Trotter, W.: Collected Papers, London, 1941.

THE GENERAL OR SUPPORTIVE TREATMENT OF WOUNDED PERSONS

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(The papers by Drs. Hoxworth, Siler, McGrath and Zinninger, with the discussion, conclude the symposium begun last week.)

In the treatment of wounded persons general supportive measures are required to overcome effects of severe hemorrhage and shock, to secure proper water balance and nutrition, to aid in wound healing and to combat infection. The judicious use of water, electrolytes, whole blood, plasma and vitamins is an attempt to restore and maintain optimal physiologic conditions in order to enhance local healing and aid in general recovery. To define supportive treatment except in relation to an individual patient at a specified time is difficult, and definition properly can be made only after repeated careful clinical appraisal and use of laboratory guides as adjuncts at regular intervals. Also limitations may exist in the form and availability of substances to be used in any one clinic. Nevertheless a rational basis for administration of supporting substances should be held clearly in the mind of any physician who treats severely wounded persons.

At the Cincinnati General Hospital the surgical division has always had a large traumatic service. It is my purpose in this article to describe the methods used here in the approach to the problems which arise in the supportive management of wounded persons.

SEVERE HEMORRHAGE

Once it is determined that severe hemorrhage has occurred, immediate replacement of lost blood volume is begun. Absence of signs of shock does not alter procedure, since they may be delayed. If the history or nature of the injury suggest that enough blood may have been lost to cause later manifestations of shock, this is sufficient. The foot of the bed is elevated unless there is a chest injury, morphine is given if the patient is restless or apprehensive, and an intravenous injection of 5 per cent dextrose and isotonic solution of sodium chloride is begun, using nothing smaller than an 18 gage needle. The rate of administration is rapid, with the bottle held at least 3 feet above the site of injection. Meanwhile plasma is obtained from the blood bank and substituted for the saline-dextrose mixture as soon as possible. The time required for this is about ten minutes and usually not more than 500 cc. of saline and dextrose solution has been given. Units of 250 cc. of plasma are added until improvement and stability are noted in blood pressure, pulse, warmth and color. If no signs of shock were present initially and no surgical procedure of considerable magnitude is contemplated, the intravenous infusion is usually discontinued after 500 cc. of saline and dextrose solution and one or two units of plasma have been given. Administration is continued in the event that the patient is moved to the operating room for a procedure such as the amputation of an extremity, débridement of a large wound, laparotomy or thoracotomy. During this time a sample of the patient's blood has been sent to the laboratory and compatible whole blood is available in about thirty minutes. Blood is then substituted for plasma and given continuously as long as it is indicated.

During the early and emergency management of these cases the quantity of plasma and blood administered and the question of how long they should be continued is determined primarily by clinical signs. In the meantime a small heparinized sample (3 cc.) of blood has been sent to the laboratory for hematocrit and plasma protein determination. If the hematocrit reading or the plasma protein content is low, more whole blood or plasma is given accordingly.

The standards of normal for plasma proteins are taken at 6 to 8 Gm. per hundred cubic centimeters and for the hematocrit 42 to 50 per cent in the male and 39 to 43 per cent in the female. The laboratory method for hematocrit determination is the capillary tube method described by Guest and Siler.[1] The plasma protein determinations are made from the same sample of heparinized blood, after centrifugation, by the falling drop method of Barbour and Hamilton, more recently emphasized by Drew, Scudder and Papps.[2] If used together and repeated from time to time, these tests are valuable aids in controlling fluid therapy. It is our belief that a well trained technician who is doing many tests must be employed if reliance is to be placed on the results.

SHOCK

In shock secondary to trauma or burns the early supportive management differs in only a few respects from that employed in hemorrhage. Morphine is used more freely because these patients tolerate large doses well. If the injury appears at all likely to be sufficient to result in shock, even though there are no positive signs on admission, intravenous replacement is begun in the manner described for hemorrhage.

In these cases, however, plasma administration is continued without the substitution of whole blood, since the intravenous administration of plasma replaces in kind the substance that is being lost into the tissues. As a result of the cellular content, whole blood is only 50 to 60 per cent as effective per unit volume. In addition, whole blood increases the viscosity of the blood (as plasma continues to be lost the red cells remain) and augments hemoconcentration. Whole blood is very useful if plasma is not available or, after the patient is stabilized, to correct anemia if it is present.

WATER BALANCE

Once the shock mechanism is corrected by plasma transfusion and local treatment to the contributing cause, attention is directed to preserving adequate hydration and securing correct water balance between the tissues and circulatory system. Water requirements must be met and, for proper distribution of the water, physiologic plasma protein and chloride levels maintained. The role of proteins and electrolytes as well as water in water balance is well known; neglect of any of the three factors will disturb the balance and may result in tissue dehydration or edema. Loss

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1. Guest, G. M., and Siler, V. E.: A Centrifuge Method for the Determination of the Volume of Cells in Blood, J. Lab. & Clin. Med. **19**: 757 (April) 1934.

2. Drew, C. R., Scudder, John, and Papps, Jean: Controlled Fluid Therapy, Surg., Gynec. & Obst. **70**: 859-867 (May) 1940.

of water, proteins and electrolytes occurs initially in injuries. Further losses of water and electrolytes may result from prolonged anesthesia, diaphoresis, fever, vomiting or continuous gastric expression. Continued loss of proteins occurs in burns, empyema and peritonitis. In addition, the metabolic loss which results during the period in which nothing is taken by mouth must be provided for parenterally. Optimum water balance is a prophylactic measure against delayed wound healing and wound infection. In some cases it may prevent edema of lungs, myocardium and liver, which favors pneumonia and disturbed cardiac or liver function.

Careful clinical observation and selected laboratory aids are the two sources of criteria for determining when and in what volume to administer parenteral water, electrolytes and proteins.

The degree of moisture of the skin and tongue and measured and recorded water intake and urinary output are regarded as the most important indexes of the state of hydration. The charting of fluid intake and urinary output is a routine essential. A urinary output of from 1,000 to 1,500 cc. in the adult each twenty-four hours indicates adequate hydration if normal kidney function may be presumed. Following the use of sulfonamides attention to establishing a good urinary output in the first twenty-four hours postoperatively and thereafter assumes additional importance in avoiding urinary and systemic complications.

In severe burns, peritonitis and empyema there is continued plasma loss into tissues and onto skin or serous surfaces, and protein reserves may become depleted. Under conditions of adequate hydration, depleted protein reserves will be reflected as low plasma protein percentage if tests are made. Hematocrit and plasma protein determinations are made daily or twice daily to learn the degree of hemoconcentration or anemia and protein loss and, when correlated with clinical judgment, serve as excellent guides to the control of fluid therapy. Intravenous solutions of 5 per cent dextrose and isotonic solution of sodium chloride are necessary for caloric and electrolyte requirement and hydration, but continued administration of these solutions if plasma proteins are below 6 Gm. per hundred cubic centimeters are guarded against for two reasons: First, further dilution of plasma proteins by hydration with crystalloid solutions may intensify tissue edema due to hypoproteinemia. Second, tissue edema may be increased by salt retention. In the presence of low or normal plasma proteins and a subnormal hematocrit, whole blood is administered until normal levels are obtained. Plasma is given in the presence of reduced plasma proteins if the hematocrit is normal or elevated.

It would be well to state here some of the limitations which we have encountered in the determination of plasma proteins by the specific gravity method. Samples taken from patients with hyperglycemia and hyperbilirubinemia may give false high results. These conditions are not encountered often in treating wounded persons. In some cases plasma protein levels of 6 to 8 Gm. per hundred cubic centimeters may persist for a short time if a fall in albumin is balanced by a corresponding increase in globulin. This circumstance frequently antecedes the fall in total protein. For this reason occasional quantitative albumin and globulin determinations are of value in the management of protracted cases. Plasma transfusions are indicated in the presence of disturbed albumin: globulin ratios, since a depletion in albumin reserves is suggested.

Solutions of electrolytes in the form of 5 per cent dextrose in saline solution or dextrose in distilled water are given in sufficient quantity to maintain adequate urinary output and normal plasma chloride levels. High fever, diaphoresis, vomiting, continuous gastric expression and diarrhea are factors which add to the rate of water and electrolyte loss in the later management of injured persons and require increased amounts of crystalloid solutions. In patients who are dehydrated initially and in whom water requirements may exceed 3,000 or 4,000 cc. for the first twenty-four hours, continuous intramuscular infusion of isotonic solution of sodium chloride is used frequently to supplement intravenous injections. A long needle is inserted deep to the tensor fasciae on the lateral aspect of the thigh. The impression is that absorption is more rapid and less painful than by the subcutaneous route. The addition of 10 cc. of 1 per cent procaine solution to each liter of fluid aids in comfort to the patient. Dextrose solution is not given intramuscularly because of painful irritation of tissues.

Normal plasma chloride levels range from 500 to 550 mg. per hundred cubic centimeters. Calculated amounts of sodium chloride given as isotonic solution of sodium chloride of 0.5 Gm. per kilogram of body weight each twenty-four hours will raise the plasma chlorides about 100 mg. This is provided abnormal chloride loss is not occurring as a result of profuse diaphoresis, protracted vomiting or continuous gastric expression. With these considerations in mind the clinician can better avoid the production of either edema of tissues due to the overadministration of sodium chloride or disturbed acid-base balance due to deficiencies. The use of plasma chloride and carbon dioxide combining power determinations are valuable laboratory aids.

NUTRITION

Other important considerations in the treatment of wounded persons are the nutritional requirements. Adequate parenteral feedings of dextrose, proteins and vitamins from day to day aid in general recovery, promote wound healing and combat infection.

Dextrose is given intravenously in the form of a 5 or 10 per cent solution, along with the water for hydration. The average adult is given about 150 Gm. each day in this form at a rate slow enough for it not to be lost in the urine. Although there is a slight individual variation, factors which alter the rate at which dextrose will be retained when administered intravenously are weight of the patient, altered metabolism due to sepsis or thyroid dysfunction, diabetes and disturbed liver function. Presuming normal thyroid, pancreatic, kidney and liver function and in the absence of high fever, the average 150 pounds (68 Kg.) patient will retain about 50 Gm. of dextrose each hour if administered intravenously at a constant rate. For this reason 5 per cent dextrose solution given for caloric requirement or to increase reserves is not given faster than 1 liter in an hour. If 10 per cent dextrose solution is given for the same purpose, it is given no faster than 500 cc. per hour. More rapid administration results in loss of the dextrose in the urine and in addition promotes dehydration and loss of electrolytes other than dextrose.

Protein requirements for nutrition are difficult to place on a rational basis if proteins are administered

intravenously. Unknown factors in protein metabolism and variations in rate of loss and initial reserves in wounded persons make this true. Pooled human plasma contains about 70 Gm. per liter. It is our practice to administer about 500 cc. each day to a patient who cannot take protein by mouth, unless subnormal plasma protein determinations or disturbed albumin: globulin ratios exist. In the event of these findings increased amounts of plasma are given.

Recently intravenous amino acid preparations have been given in a few cases. Our use of these has been very limited, but, based on the experience of others, preparations of these kinds offer much promise in the future as available sources of proteins for nutritional purposes.

In addition to maintaining high protein, high carbohydrate and adequate salt reserves, particular attention is paid to vitamin needs. Vitamin deficiency, if allowed to occur in patients depending on parenteral feeding for nutrition, may complicate recovery immeasurably. The prevention of deficiencies yields more gratifying results than attempts at correction after deficiencies occur, but they frequently exist prior to the time of injury. This is particularly true of patients received at a general hospital. The amounts of vitamin A, B, C, D and K to be given vary greatly according to the estimated state of general nutrition before injury, the presence or absence of symptoms of specific vitamin deficiency and the expected lapse of time before adequate enteral intake can be begun.

Patients who receive large amounts of dextrose for caloric requirement should receive thiamine, riboflavin and niacin in the ratio of 1:2:10, as recommended by a joint committee of the Council on Pharmacy and Chemistry and the Council on Foods and Nutrition of the American Medical Association.[3] For maintenance, 2.5 mg. of thiamine, 5 mg. of riboflavin and 25 mg. of niacin may be considered sufficient. If there is clinical evidence of a specific vitamin deficiency, the basic formula may be supplemented by additional amounts of the deficient vitamin or vitamins. Brewers' yeast is used extensively as soon as it can be tolerated orally. Vitamins A and D are given as indicated for fulfilment of maintenance requirements or for manifested deficiencies. Vitamin A deficiency, if allowed to continue, may predispose to intercurrent infections.

In protracted hemorrhage or for patients on nothing or little by mouth after injuries to the gastrointestinal tract, prothrombin deficiencies may exist. Synthetic vitamin K and fresh blood plasma are the materials used to correct hypoprothrombinemia. In order to aid wound healing, vitamin C in doses of 100 to 500 mg. a day is administered parenterally to patients who have wounds in which healing appears to be delayed and who are on nothing by mouth. The determination of the plasma vitamin C content is helpful as a guide to adequate dosage.

ANEMIA

Anemia may exist as a result of blood loss at the time of injury and during operation; it may antedate the injury or it may be secondary to sepsis following injury. In any event poor oxygenation of tissues will delay wound healing and general recovery. In the treatment of anemia either whole blood or red blood cells suspended in 5 per cent dextrose and isotonic solution of sodium chloride are used. The suspensions are by-products of the blood bank obtained during plasma production and are available in large amounts, since plasma is processed for all hospitals in the metropolitan area. These are given to patients with anemia whose enteral protein intake is adequate. One pint of whole blood or the cell equivalent in suspension can usually be depended on to elevate the red blood cell count by about 400,000 cells and the hemoglobin by 1.1 Gm. This is provided a febrile reaction does not occur and the blood is less than four days old. Older bank blood, in which hemolysis of the red cells is advanced, is very effective, however, in the treatment of anemia. The response in the red blood cell count and hemoglobin is delayed when compared to that obtained when fresher blood is given, but the products of hemolysis are evidently a readily available source of supply for regeneration of red blood cells and hemoglobin.

It is well to mention here that, whenever a transfusion of blood is repeated after an interval, Rh— blood should be selected for any recipient whose cells are Rh—. It has been well established by Wiener[4] and confirmed in this clinic as well as by others that earlier transfusion of Rh + blood cells to an Rh— individual may result in the formation of immune anti Rh agglutinins. The subsequent transfusion of Rh + cells after an interval of several days may result in a hemolytic transfusion reaction. These reactions are not usually as severe as those due to incompatible A and B factors, at least as far as incidence of mortality is concerned, but they jeopardize opportunities for recovery and defeat the purpose of a transfusion given for anemia. At present in this clinic Rh determinations are made, regularly, but Rh + blood and Rh — blood are given indiscriminately to Rh — recipients in order to make a statistical study of the incidence of reactions.

SUMMARY

Improved supportive management of severely injured persons has yielded gratifying results in many clinics. It has been made possible by a combination of efforts. Fundamental observations made on the mechanisms which operate in shock and in severe hemorrhage have led to a clearer understanding of the indications for substances to be used to prevent or correct disturbances. Likewise, this is true for incorrect water and acid-base balance, defective nutrition and anemia. The development of laboratory tests and standards for objective appraisal of the patient have contributed. Improvements in the quality of supporting substances and in facilities for their availability and administration have been made in hospital and commercial laboratories. Examples of these are carefully operated blood and plasma services, and the preparation of solutions to which the best known standards for safety and quality are applied.

A factor of equal importance in the provision of optimum supportive therapy to wounded persons has been the dissemination of knowledge to the practicing physician through medical literature. Continued investigation of newer substances such as various blood substitutes, protein fractions and vitamin complexes no doubt will add to his armamentarium in the near future.

3. Report of the Council on Pharmacy and Chemistry and the Council on Foods and Nutrition: The Proper Use of Vitamins in Mixtures, J. A. M. A. **119**: 948 (July 18) 1942.

4. Wiener, A. S.: Hemolytic Reactions Following Transfusions of Blood of the Homologous Group, Arch. Path. **32**: 227 (Aug.) 1941.

THE MANAGEMENT OF HEAT BURNS

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Current medical military reports reveal that heat burns constitute one of the most serious problems to manage in the present war. From past and present experiences we know that these cases are no less difficult to treat in civilian practice. It is not inconceivable that such injuries of this category will occur in large numbers from sabotage, in industry producing ammunition and inflammable materials and may even result from enemy bombing. These possibilities should excite the interest of every physician regarding the treatment of the burned patient. Further, it might be a sagacious plan for every hospital throughout our land to develop a definite program utilizing a "burn team" which would facilitate the handling of these cases. Many hospitals have already instituted such measures.

A burn represents thermal injury to the skin and underlying tissues. Such injuries have been classified by most observers as being first, second and third degree. More important is the extent of the involved area rather than the depth of the injury. Although cutaneous destruction alone is a vital pathologic feature in cases of burns, the disturbances which proceed after this occurrence are equally important. Death of skin immediately suggests loss of normal surface protection, loss of function of the sebaceous and sweat glands and loss, in part, of the normal mechanisms for control of heat radiation and fluid balance. The exact effect of these disorders has as yet not been shown.

The second phase of abnormal physiology is concerned chiefly with the effect of the injury on the vascular system. The fluid which exudes from the burned surface and which shifts from the vascular bed to the tissue in and about the burned area, creates one of the most distressing features of the injury. Lowering of blood plasma volume produces a relative increase in the volume of cells in the blood.

At the present time nearly all observers believe that this state of hemoconcentration is largely responsible for the production of "thermal shock" seen in serious burns. Accurate and complete realization of these basic principles will insure a more practical and scientific approach in the treatment of such cases.

Heat burns may, for the sake of simplicity, be divided into major and minor injuries. Any burn whose area represents more than 10 per cent of the total body surface (Berkow's chart) should be classified as major and warrants hospitalization. It is not unwise to hospitalize every infant or child with a burn regardless of the extent of the injury.

In any major burn there are two fundamental points of approach to therapy. These are (1) general treatment of the patient and (2) the definitive treatment of the burned area. There is really no question concerning the importance of the first approach and, in general, nearly every one is in agreement with the principles advocated. The main fault lies in the fact that we fail to see them instituted and become more concerned about treatment of the burned area. In most instances this is the most important factor. There is no universal agreement regarding care of the burned area. The "pros and cons" are likely to exist until a decidedly more ideal local method of therapy is found. The utopia desired is one which fulfils the factors of rapid application, simplicity, sterilization and protection of the wound, minimal plasma loss at the site of injury, comfort and ease in handling the patient and, above all, one which affords rapid epithelization or which promotes a granulating wound that may be grafted early, thus minimizing both loss of time and of function from such injury.

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GENERAL TREATMENT OF THE PATIENT

The considerations under this division may be divided into immediate first aid measures and hospital treatment.

First Aid Measures.—At the time of a serious catastrophe confusion usually exists and in many instances the persons dealing with the victims apply measures that are contraindicated and harmful to the patient. In extensive burns, physicians should discourage the application of ointments, oils and various "home remedies" to the burned area by advocating the use of dry clean sheets or towels if dry sterile dressings are not available. Physicians should continue to encourage good general first aid principles. The patient should be kept warm. Small amounts of hot drink may be taken. If at all possible a sedative should be given, an accurate record being kept as to time and amount administered. Attention should be focused on efficient and rapid hospital disposition.

Hospital Treatment.—At the hospital all persons connected with the care of these patients should be properly capped and masked in an effort to lessen further contamination of the wound for which treatment is being instituted. A rapid general survey may be done including a brief history, a physical examination as far as possible and immediate laboratory procedures, including urinalysis and complete routine blood studies. In our clinic heparinized blood is obtained for hematocrit and plasma protein determinations. Although the latter observations are not absolutely essential, they are nevertheless useful in the guidance of fluid therapy.

It is agreed that pain suffered by the seriously burned patient is an important factor in the production, progress and prolongation of "thermal shock" which may result. It is to be remembered that such patients can tolerate and should have large doses of morphine. In many instances twice the normal dosage should be administered. Control of pain in children is as important as it is in adults.

Since the extensively burned patients rapidly lose their plasma volume, plasma should be given. "Thermal shock" can to a great degree be prevented by the early dispensation of blood plasma, serum, human albumin or any other adequate blood substitute. Even if present when the patient is first seen, the administration of plasma may be a life saving device, provided an irreversible state has not already ensued. Watchful waiting for signs such as a low blood pressure and a failing circulation before instituting plasma therapy to raise the plasma volume is to court disaster. The best index of need for therapy, as well as the control of plasma administered, is either hematocrit or hemoglobin determination in conjunction with the red blood cell count. In the early period of the injury whole blood transfusion may be harmful, for as plasma continues to be lost the red blood cells remain. To produce further hemoconcentration will only increase the degree of shock rather than lessen it. While whole blood is useful

when anemia occurs, it should not be given in the early course of such an injury unless severe anemia is present. Crystalloid solution should be used with care. A solution of 5 per cent dextrose in isotonic solution of sodium chloride may have advantages over sodium chloride solution alone. In a state of hypoproteinemia too much sodium chloride may cause intensification of the local edema. We have preferred to give blood plasma by the intravenous drip route, using twice normal dilutions. In some instances it has been given intrasternally and also by subcutaneous infusion. It is important to remember that plasma should be continued as long as serious hemoconcentration exists.

In extreme burns the administration of oxygen may be beneficial. We have instituted nasopharyngeal oxygen on admission to the receiving unit. In some instances continuation of oxygen therapy is indicated for days or until all signs of anoxia are gone.

The administration of adrenal cortex extract remains in an experimental state. Although its use may not be harmful there is no absolute proof that it lessens the degree of "thermal shock." Usually we give an initial 2 cc. dose intravenously and then 1 cc. by hypodermic injection every four hours thereafter.

Recent experiences both in our clinic and elsewhere suggest that local sulfonamide therapy is contraindicated. Furthermore, investigation has rather conclusively shown that sulfonamide drugs are far more effective given systemically, particularly if given early. The routine use of intravenous sulfonamide medication is not without danger or complications. If there are no contraindications, sulfadiazine may be helpful in the control of local infection. We have given 2.5 to 5 Gm. intravenously as the initial dose and then 1 Gm. either every four or six hours as desired. The important consideration is control of the drug. A daily urinalysis and white blood cell count should always be done. A blood sulfonamide level is indicated at least every other day. With the appearance of any danger sign the drug should be discontinued.

DEFINITIVE TREATMENT OF THE BURNED AREA

Only after general therapeutic measures have been started should one consider definitive treatment of the burned area. Recently Koch and his associates [1] presented a new approach to this problem. We [2] have confirmed their observations. In many respects this method of dealing with the burned area appeared too revolutionary, yet on careful analysis it embodied basic fundamental principles regarding wound care, whether the result of a burn or another traumatic agent.

Briefly reviewing this method, it will be recalled that the burned patient is treated under ideal antiseptic conditions. With or without anesthetic agents the involved areas are cleansed gently with white (neutral) soap and water, using soft sterile cotton pads. This procedure is done with the least possible trauma. All loose devitalized skin is removed and all blisters are broken. After adequate cleansing (about ten minutes) the involved regions are flushed with quantities of isotonic solution of sodium chloride. The wounds are covered with sterile fine meshed gauze impregnated with petrolatum or hydrous wool fat. This dressing does not adhere to the raw surface as a coagulant crust, it does not fix and destroy viable tissue, yet it still permits drainage into the dressings outside it.

The pressure dressing is completed by placing flat gauze on top of the nonadherent dressing. A uniform pressure dressing is created by adding fluffed gauze plus either sterile mechanics' waste or sterile sea sponges. This pressure dressing can be maintained by using elastic bandages or muslin bandage plus adhesive tape as the final outer dressing.

When movable parts are involved, such as the upper and lower extremities, immobilization can be maintained by either sterile aluminum splints or light plaster casts. There is sufficient clinical evidence to show that such immobilization aids in the healing of the burned area. These dressings remain untouched for from ten to fourteen days unless one has good reason for their removal.

At the time of the initial dressing one can better evaluate the true picture both as to the degree of infection and, more important, the destroyed area of body surface. If large third degree granulating areas are observed, they should be immediately prepared for skin grafting. Early replacement of skin is important. First and second degree burns usually appear well at the time of the initial dressing. Third degree wounds in many instances appear dirty, owing to a combination of sloughing tissue and infection. In this instance wet dressings, usually boric acid or saline solution, are instituted. At the end of forty-eight hours treatment of the wound with a solution of sodium hypochlorite is begun in preparation for grafting. When the wounds are clean an ointment dressing is reapplied.

It is rapidly becoming a well established fact that the trend in the definitive treatment of the burned area is the pressure ointment type of dressing. We have used this method of therapy for the past three years and, although we recognize imperfections in it, we do, nevertheless, believe that it has advantages over other methods of definitive therapy. This method fulfils many of the factors to be desired, namely protection of the wound, comfort and ease in handling the patient and minimal plasma loss from the wound and promotes a granulating wound which may be grafted much sooner than third degree areas treated by the eschar methods. Furthermore, this dressing permits rapid visualization of the areas at any point in the progress of the case.

SUMMARY

It might be said that the modern trend in the treatment of the severely burned patient is first of all concerned with the general treatment of the patient and, secondly, with the definitive treatment of the burned area. Since there are at present so many different methods of local therapy we may well assume that no one method fulfils the ideal form of treatment. However, the tendency at the present time is to utilize a method which does not add further injury to an already injured patient and which at the same time is relatively simple, protects the injured area, allows minimal plasma loss from the wound, promotes comfort and ease in handling the patient and, above all, one which affords rapid epithelization or which promotes early grafting of the third degree wounds. It would appear that "primary cleansing, compression and rest treatment of burns" more nearly approximates the desired effect than any other treatment of choice.

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WOUNDS OF THE CHEST

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Chest injuries are quite properly divided, for clinical purposes, into two large groups: nonpenetrating wounds and penetrating wounds. The distinction is the obvious one that in the latter there is a break, greater or less in extent, in the normally hermetically sealed thoracic cavity, while in the former such a disruption does not occur. The categories are not entirely mutually exclusive, as an injury producing multiple segmental rib fractures, while not a penetrating wound, may nevertheless produce all the disturbances of physiology present in the most severe types of penetrating wounds. With such obvious exceptions, however, the classification of wounds as penetrating and nonpenetrating serves admirably for diagnostic and therapeutic purposes.

NONPENETRATING WOUNDS

Severe contusions of the chest wall producing such bizarre injuries as fractures of the sternum, chondrosternal separation of the ribs, traumatic rupture of a lung, traumatic asphyxia and contusions of the heart do occur in civilian life but are sufficiently rare that they may properly be omitted from the present brief discussion. Contusions producing fractures of the ribs constitute probably the commonest type of chest injury. Such injuries, however, are more properly within the sphere of fractures and are not germane to the present discussion unless such fractures are sufficiently numerous and extensive to produce a break in the rigidity of the chest wall or, by perforation of the visceral pleura, break the airtight seal of the pleural space. Finally, there are open wounds of the chest wall which do not penetrate the parietal pleura. Such wounds are those produced with cutting instruments or with stabbing instruments, such as ice picks or narrow bladed knives, which have been deflected, usually by the ribs or sternum, and spend their force dissecting along the superficial tissue planes of the thoracic cage. Wounds of this type are also occasionally seen, although quite uncommonly, when a bullet is deflected by the bony structures of the chest wall. Under these circumstances the missile will sometimes travel along a rib over an arc of as much as 135 to 150 degrees and on rare occasions is seen to encircle an entire hemithorax. Except for the necessity of ruling out penetration of the pleura, these wounds differ little, if at all, from similar wounds elsewhere in the body. One exception, however, may be indicated. Practically all lacerations and stab wounds, and the majority of bullet wounds, are sustained during fights. The outer and intermediate layers of the thoracic cage are made up of the muscles controlling locomotion of the arm and, considering the vast range and complexity of these motions, it is virtually impossible to know in what relationship these muscle layers stood to the skin at the time injury was sustained. For this reason it is thought inadvisable to attempt a complete excision of the wound except on those rare occasions when the entire wound is visible. To attempt such an excision under other circumstances either would necessitate an unjustifiably large removal of tissue or would entail blind probing, involving an unjustifiable amount of tissue trauma. It is thought better in most instances, therefore, to be content with débridement of the obvious wound in the superficial structures with loose primary closure.

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PENETRATING WOUNDS

As already noted, the characteristic feature of penetrating wounds lies in breaking the seal of the pleural space. The resultant alterations in the dynamics of respiration and circulation produce phenomena so profound and unique as to separate wounds of the chest from all other types of injury. Space does not permit a repetition here of the already familiar mechanics of respiration, but a knowledge of these pressure relationships is absolutely indispensable to an understanding of the clinical phenomena observed, an appreciation of the gravity of the injury and the uncertainty of prognosis, and an intelligent approach to the treatment of such injuries. It is presumed, therefore, that the physician essaying to handle such injuries will have thoroughly familiarized himself with the normal physiology of respiration and circulation as well as with the mechanical possibilities when the conditions necessary for such normal physiology are altered.

While there are numerous methods of classifying penetrating chest wounds, probably the simplest one is that based on the anatomic structures injured. The least complicated type of penetrating chest wound encountered is that in which the perforating weapon is small, passes through the thoracic wall with minimal trauma and opens the parietal pleura without injury to the underlying visceral pleura. Considering the extremely narrow margin involved, it would seem theoretically that the incidence of such wounds should be relatively small. One is rather surprised, therefore, at the large number of wounds of this type encountered in a large traumatic service. The only proof, of course, of such an occurrence is the presence on x-ray examination of a thin layer of air separating the pleural surfaces or a small cap of air over the apex of the lung on an upright film. Obviously a similar finding can be produced by a very minute perforation of the visceral pleura which seals off almost immediately. The practical clinical problems involved in each instance being identical, however, the distinction is hardly necessary. Treatment of this type of injury is the basic therapy for all penetrating chest wounds. The patient is treated for shock, if present. The involved hemithorax is immobilized, particularly at the base, with an adhesive strapping extending beyond the midline anteriorly and posteriorly and applied with the patient in extreme expiration. The patient is kept in bed in high Fowler's position for a period varying from five to ten days, and sufficient morphine is administered to keep him quiet. He is watched very carefully, particularly during the first twenty-four hours, for the development of any additional phenomena, and these are treated according to their nature.

Between the foregoing and the next more serious type of injury lie all degrees of wounds with comparably increasing amounts of simple pneumothorax. When, however, the opening in the thoracic wall is sufficiently large to permit free to and fro movement of air, a much more profound picture develops. Such patients experience immediate and grave shock. Not only is the lung on the injured side completely collapsed but, owing

to the distortion in pressure relationships, the opposite intact lung undergoes a serious reduction in its capacity, resulting from the paradox in respiration transmitted from the injured side. This enormous embarrassment to respiration is further complicated by an even more serious burden imposed on the central circulatory mechanism. Not only does mediastinal flutter reduce circulatory efficiency to a dangerously low level but the twisting character of this swing, induced by the rotary motion of the heart beat, initiates reflexes in the extracardiac autonomic nervous control mechanism the results of which, while not clearly understood as yet, undoubtedly have an extremely grave effect on the entire vasomotor control mechanism of the body, central as well as peripheral. This is empirically evident from the fact that, even despite prompt closure of the defect in the thoracic wall with subsequent complete evacuation of the pneumothorax, it is very difficult and not infrequently impossible to retrieve the patient from the shock incident to the initial injury. Treatment of such wounds consists in immediate closure of the opening in the chest wall with anything handy. Clothing, towels or surgical dressings, moistened if possible but dry if necessary, should be placed over or into the defect until the patient can be properly treated. This is one of the few instances in which treatment of the injury proper takes precedence over treatment of shock and in which considerations of sterility and contamination must be abandoned to the extreme urgency of the patient's condition. Preferably such patients should be treated definitively at the place of injury rather than being transported, but such a possibility rarely occurs in civilian life. This being so, the patient is given whatever therapy is available to impede the progress of shock and then transported with maximum expedition to a point where more complete treatment can be carried out. Whenever possible, treatment of shock and of the wound itself should be carried out simultaneously; but when the opening in the chest wall has been securely closed, treatment of the chest can be limited at the most to an attempt to aspirate the pleural cavity in an effort to increase available pulmonary capacity. It is not only safe but probably better judgment to expend as much as two or even three hours in reducing the patient's shock rather than to subject the patient to definitive therapy while still in this grave condition. Obviously, when no progress is being made in relieving the shock, one should not continue to rely on such fruitless measures alone. In this instance direct therapy to the chest is carried out intercurrent with the treatment of shock.[1]

Under positive pressure oxygen the emergency dressing is removed and, ideally, the remainder of the procedure carried out under field block local anesthesia. It is believed that, unless absolutely necessitated by the patient's inability to or unwillingness to cooperate, inhalation anesthesia is to be avoided because of the incipient danger of subsequent pneumonia. When the use of inhalation anesthesia is inescapable, cyclopropane is preferable to ether. Anesthesia having been secured, the wound in the chest wall is thoroughly excised and all local bleeding controlled. The lung is then examined carefully for breaks in the visceral pleura, and these are closed if possible. The pleural cavity is then thoroughly irrigated with saline solution. Larger wounds of the lung will be considered later. The use of sulfanilamide in the pleural cavity has been subject to some question recently, but until more conclusive evidence of its deleterious effects is adduced it is felt wiser to use this drug in the pleural cavity prophylactically. The defect in the chest wall is then closed by approximating the adjacent ribs with stay sutures of some strong material such as silkworm gut, kangaroo tendon or steel wire. These materials may be buried beneath the skin or used as through and through sutures to be removed subsequently. Transected muscle layers are approximated and the skin is closed tightly. If the pleural cavity is thought to have been sufficiently contaminated, closed drainage with a catheter may be established at a point away from the initial wound. Preferably, however, the chest is closed without such drainage. Following closure the pleural cavity is evacuated of air by passing a large needle into it and then expanding the lung under positive pressure. All of the foregoing presupposes, of course, that the patient has been relieved of his shock and is in condition to withstand such operative manipulation. When there is any question as to the patient's condition it is wiser to be satisfied with simply removing the emergency dressing and substituting for it closure by through and through stay sutures passed about the ribs above and below the wound, and the application of a large sealed dressing, leaving to chance the possibility of infection developing.

The derangement in physiology that has been described is produced in another fashion by a third type of wound. In these cases the opening in the thoracic wall is relatively small but the nature of the injury, usually a tangential wound, produces a valvelike mechanism through which, on inspiration, air enters the pleural cavity but on expiration is unable to escape. The result is a tension pneumothorax in which intrapleural pressure builds up rapidly with consequent displacement of the intrathoracic viscera. Here the embarrassment is mainly respiratory, from reduction in available lung capacity, and the factor of circulatory distress, so prominent in open sucking wounds, is of less relative significance. Notwithstanding this, such a patient's condition is very grave and must be relieved promptly to avoid death. Treatment consists in decompression of the pneumothorax through a needle or catheter connected with a tube which discharges the pleural air under water. This decompressing mechanism having been established, the traumatic opening is closed and the lung allowed to reexpand. When the thoracic wound is limited to the chest wall it is better to use a needle for decompression, removing it when the lung has reexpanded; but if the situation is complicated by hemothorax or there is a question of the lung itself having been lacerated, the catheter is the preferable instrument and it is left in place until the danger of further pleural pathologic conditions has passed.

The foregoing types of chest wounds can and do occur simply or they may be associated with bleeding of considerable degree from the chest wall into the pleura. Such bleeding occurs most frequently as a result of the intercostal vessels having been involved in the wound. The position of these vessels beneath and behind the shelving inferior rib margin makes it easier for bleeding to occur into the pleural cavity than to the surface of the body. Occasionally bleeding arises from a severed internal mammary vessel, but it is felt

1. The reader is referred to the article by Dr. Hoxworth for a detailed description of shock therapy.

that hemorrhage from one of these vessels is less frequent than is customarily supposed. Unfortunately, experience demonstrates that such an error in diagnosis is made in some instances in which the pericardium or the extrapericardial great vessels of the mediastinum are the true source of hemorrhage. Certainly involvement of these latter structures must be eliminated conclusively before the diagnosis of a bleeding internal mammary vessel is acceptable.

Hemothorax resultant from such injuries is usually associated with a greater or less degree of pneumothorax. The diagnosis is made by the customary physical findings plus x-ray evidence. In this variety of hemothorax, in which an intact lung continues to expand and contract, bleeding is controlled when sufficient tension is reached. It is preferable, therefore, to treat such patients conservatively, allowing the body to resorb the blood, unless the hemothorax has reached sufficient size to produce respiratory embarrassment. Even then the hemothorax should be decompressed guardedly, 500 cc. of blood being somewhat arbitrarily the maximum to be removed at one time, and that replaced with about 300 cc. of air in order to continue the pressure tamponade on the bleeding vessel lest the hemorrhage be renewed. It is usually found under these circumstances that the intrapleural blood is quite fluid, having been defibrinated by the churning movement of the lung.

In the majority of serious penetrating thoracic wounds the problem is further complicated by injury of the lung. The amount of pulmonary damage varies all the way from tiny wounds, involving a minimal amount of peripheral lung parenchyma, which seal themselves automaticaly, to great gaping lacerations crossing main stem bronchi and great hilar vessels. Obviously, in the majority of instances the wound will lie between these two extremes and closer to the less serious than to the more serious. Findings in these patients are almost invariably those of a mixed hemopneumothorax, the predominating element depending on the size of the pulmonary vessels involved. Except when a valvelike wound in the lung has been produced, pressure pneumothorax is relatively uncommon and control of hemorrhage is the more important problem. Usually this control is established automatically, but frequently at the expense of considerable loss of blood. The break in the visceral pleura causes immediate and usually complete collapse of the lung with loss of the tamponade provided by this structure when intact. For this reason it is thought inadvisable to remove the intrapleural blood unless respiratory embarrassment makes such a measure imperative, a situation unlikely under the circumstances. In the majority of instances conservative treatment will suffice. However, there is an increasing belief that, when pulmonary damage is great enough to produce shock which responds poorly to intensive therapy, the results of conservative handling have been so poor that more radical measures should be employed. Both at operation and at autopsy it has been found that such bleeding does not confine itself to the massive hemothorax. There is gross dissecting interstitial pulmonary hemorrhage. Another indication of the inadequacy of conservative therapy is the finding in some cases of a laceration of one of the great pulmonary vessels, hemorrhage from which could be controlled only by ligation. The measures to be employed in operative treatment of these injuries will vary with the nature and degree of injury encountered in the individual case and include such procedures as simple pneumoplexy, exteriorization of the injured portion of the lung, partial or complete lobectomy or, if necessary, pneumonectomy. It should be pointed out that, when a relatively simple wound in the lung is complicated by injury of a great pulmonary vessel, the only procedure necessary is ligation of the vessel. The pulmonary circulation is not the nutrient blood supply to the lung, on the one hand, and the anastomoses of the pulmonary venous circulation are ample to provide sufficient decompression when the injured and ligated vessel is a pulmonary vein.

Penetrating thoracic wounds are occasionally complicated by the fact that both the pleural cavity and the peritoneal cavity are opened and made to communicate. These wounds are particularly serious when the hollow abdominal viscera are perforated and the pleural cavity contaminated with gastric or intestinal contents. The natural tendency, particularly when the penetrating thoracic wound is relatively small, is to explore the abdomen, closing perforations of the viscera, and to treat the thoracic injury conservatively. In view of the extremely high mortality in cases so handled, it is more and more becoming the opinion of clinicians seeing this type of injury that the better procedure is to treat both cavities radically, exploring the abdomen first and thereafter doing an open thoracotomy, cleansing the pleural surfaces thoroughly by repeated saline irrigations and closing with catheter drainage after instillation of sulfanilamide prophylactically. Whether or not this extremely radical point of view will result in a reduction in mortality from this type of injury is as yet conjectural. It can scarcely increase mortality except in speed of demise.

One major type of penetrating chest wound remains, namely wounds involving the mediastinum and its structures. For practical purposes such wounds may be considered as injuries to the pericardium and its contents. The numerous repetitions of the presenting clinical picture in these wounds cannot be overemphasized. While the pericardium and heart can be injured from almost any position in the chest circumference, the vast majority of such injuries result from weapons penetrating the anterior thorax. It has been found that the only safe criterion to follow is an extreme one. To rely on the probability that penetration of the pericardium is likely only when the wound of entrance is in the so-called vulnerable triangle of the left anterior midthorax or that pericardial wounds are improbable when the point of entrance is in the right hemithorax is to court disaster. When a chest wound enters the anterior thorax anywhere between the midclavicular lines, a wound of the pericardium and heart must be ruled out rather than in. A further precaution is recognition of the fact that, while the clinical picture of tamponade is pathognomonic of intrapericardial injury, the absence of this picture does not preclude such injury. The clinical picture in wounds of the heart and other intrapericardial structures depends in large measure on the nature and position of the wound in the pericardium. If this opening is small enough or so placed that hemorrhage from the heart wound cannot escape, tamponade of cardiac movement results. Classically, such a pathologic condition is manifested in the Beck triad of acute cardiace tamponade, viz. a falling arterial pressure, a rising venous pressure and

a quiet heart. The entire picture is not always present, however, and even when present is not always recognized. The first finding may very well be misinterpreted as a sign of ordinary shock, while the third, being entirely dependent on personal interpretation, can easily be overlooked. Of the three the elevated and rising venous pressure is the one most constantly seen and least subject to misinterpretation. Auxiliary but less constant clinical guides are paradoxical pulse, distention of the veins of the neck and reduction of cardiac excursion when viewed fluoroscopically.

If, on the other hand, the opening in the pericardium is sufficiently large or so placed that bleeding from the heart wound can decompress itself into the pleural or peritoneal cavities or to the outside, tamponade will fail entirely to develop. The clinical picture then will be one of most profound hemorrhagic shock. Incredible as it may seem, patients so injured do not die immediately. In fact, they can and do live for extraordinarily long periods of time. In these cases practically the only criteria for a diagnosis of wounds of the heart are the position of the wound of entrance and the profound degree of shock. It has been found that not a few injuries diagnosed ante mortem as severe pulmonary injuries are demonstrated at autopsy to have been undiagnosed intrapericardial wounds. In this type of heart wound both arterial and venous pressure will be very low, if at all demonstrable.

Except under the most unusual and clearcut circumstances of minimal intrapericardial bleeding, the therapy indicated in all heart wounds, whether with tamponade or with gross hemorrhage, is operative. This consists in closure of the heart wound, thorough evacuation of blood clot from the pericardium and loose closure of the operative wound in the pericardium to permit adequate decompression of the effusion which invariably follows such operative intervention. Mortality from wounds of the heart, in the hands of interested and experienced clinicians, has been lowered during the past ten years at a most gratifying pace. The current death rate in clinics seeing an appreciable number of these patients is about 23 per cent.

COMMENT

The foregoing outline of thoracic wounds is obviously not exhaustive. Such a complete exposition of the subject would be possible only in monograph form. It is believed, however, that the major types of thoracic injury have been enumerated and the salient differences, both in the nature of the pathologic changes produced and in the indicated therapy, outlined. In recapitulation it should be pointed out that it is the penetration of the pleural cavity with the consequent distortion in the mechanics of respiration and circulation that distinguishes thoracic wounds from those in other portions of the body. Such aberrations in these life sustaining physiologic mechanisms do not allow much margin of safety and demand of the physician a thorough understanding and appreciation of the normal physiology and of the disturbances resultant from disruption of this mechanism. Therapeutically such wounds require prompt attention and, not infrequently, delicately balanced judgment. The past twenty-five years, with the enormous progress made in this field of traumatic surgery, is ample demonstration that the effort expended and the risks and responsibilities accepted by pioneers in this field have been generously rewarded.

PENETRATING WOUNDS OF THE ABDOMEN

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The operative treatment of penetrating wounds of the abdomen has changed but little in the past twenty years. Lower mortality has been attained chiefly by the introduction of improvements in anesthesia, by the more liberal use of blood and plasma transfusions, by the postoperative use of continuous gastric suction and by the use of the sulfonamide drugs. A patient presenting himself with a penetrating wound of the abdomen should be examined quickly but thoroughly to see, first, if he is in shock, second, the nature and extent of the external wound and evidence as to the direction of the stab or gunshot wound, and, third, for signs of peritoneal irritation. Local exploration of the wound, except under anesthesia, is usually not a wise policy, for it may spread infection to probe it and may lead to erroneous conclusions as to whether it penetrates the peritoneal cavity. In cases of doubt, exploratory laparotomy should always be performed, and only when complete exploration of the wound demonstrates that the peritoneum is not implicated can laparotomy be safely omitted. On account of the high mortality rate in gunshot wounds of the abdomen with operation, attempts have been made in the past to treat groups of patients by nonoperative methods. This has uniformly led to higher death rates than with operation, so that conservative management has been abandoned except for patients at the point of death or those who have survived for several days before reaching a hospital.

If shock is present it should be the first thing treated. In our experience the most important cause of shock in penetrating wounds of the abdomen is hemorrhage, and therefore transfusion of whole blood is the procedure most clearly indicated. With an adequate blood bank, blood for this purpose is available as soon as typing can be carried out, and it should be given promptly. Other than the treatment of shock, little preoperative preparation is necessary, unless some intra-abdominal structure protrudes through the wound. In such cases the peritoneal mass should be washed gently with isotonic solution of sodium chloride and covered with moist sterile gauze until the patient reaches the operating room. Only rarely is there severe bleeding from the abdominal wall and this can usually be controlled by pressure or packing, though occasionally it may be necessary to clamp and ligate a vessel. In cases of gunshot wounds it is often desirable to examine the patient with the fluoroscope before operation to see the position of any retained bullet or bullet fragments. By seeing the bullet and knowing its relationship to the wound of entrance one can often get a fairly good idea of what intra-abdominal structures may have been traversed. For anesthesia, our preference is for cyclopropane or ether or a combination of these, using an intratracheal tube and a closed system. Many patients who are brought to the hospital with penetrating abdominal wounds have a full stomach, and there is

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often considerable danger of vomiting during the induction of anesthesia with aspiration of material into the trachea. Rapid induction, using cyclopropane, reduces the risk considerably. In most instances our patients are given morphine ⅙ grain (0.01 Gm.) and scopolamine 1/150 grain (0.0004 Gm.) about thirty to forty minutes before induction. Some years ago a group of patients with penetrating wounds of the abdomen were treated at this hospital with an attempt to empty the stomach by lavage before operation. This proved to be wholly unsatisfactory and had to be abandoned. Frequently the patients would not be able to take the tube without vomiting and, once started, it often continued through the induction period. Even if the tube was passed successfully without vomiting, the food particles in the stomach were usually found to be too large to go through the tube. Now, with adequate sedation and rapid induction, followed by intratracheal intubation, the incidence of aspiration pneumonia has dropped almost to the vanishing point.

Combined penetrating wounds of the thorax and abdomen offer a particularly bad prognosis. The pneumothorax which is almost invariably present increases the degree of shock and renders the patient less able to withstand the operative procedure required. In addition, with wounds involving the left diaphragm and stomach, gastric contents may enter the left pleural space and produce an ideal setting for the development of empyema. In such cases the thorax usually should be opened and the pleural surfaces cleansed mechanically and washed with isotonic solution of sodium chloride. Sulfanilamide powder is then placed in the cavity and tube suction drainage instituted. If there is no gross soiling of the pleural cavity, the thoracic cavity is closed as the lung is reexpanded by increasing the pressure in the intratracheal tube.

The causes of penetrating wounds of the abdomen are somewhat varied. The commonest ones in civil practice are ice pick, knife, razor, pistol, rifle and shot gun. In a series of 43 cases at the Cincinnati General Hospital 26 were the result of knife wounds and 17 of gunshot. The high mortality which has always been present with such wounds is due principally to hemorrhage, and to peritonitis from the perforation of hollow viscera, although, in the past, pneumonia or some other complication was also a prominent cause of death or factor contributing to a fatal outcome.

Hemorrhage may vary tremendously from practically none to exsanguinating loss from perforation of large vessels such as the renals, mesenterics or even the vena cava. Perforation of a solid viscus such as the kidney, liver or spleen may also be associated with a great loss of blood. Retroperitoneal hemorrhage may be quite extensive and particularly difficult to control.

Infection results principally from gross spilling of gastrointestinal contents from visceral perforations, though it may occasionally be due to material such as bits of clothing or other foreign material being carried into the wound. In civil practice most penetrating wounds occur as the result of fights after eating or drinking, and the extravasation of recently ingested food from the stomach is particularly bad. Material from the duodenum and upper ileum does not usually lead to serious infection, but that from the lower ileum and colon may cause severe contamination.

In the management of cases of wounds of the abdomen a sterile dressing is applied as soon as possible to any open wound, and the patient is treated for shock if this is present. Blood is drawn for typing and, if shock is extreme, intravenous plasma is started immediately, to be replaced by whole blood as soon as typing has been carried out. Oxygen therapy may be indicated in some cases. After a negative skin test, prophylactic antitetanic serum should be given. The question as to whether the wound penetrates the peritoneal cavity and its direction or course may be one requiring some consideration and often considerable judgment. If frank signs of peritoneal irritation exist or if intra-abdominal viscera protrude, perforation may be considered as established. The absence of signs of peritoneal irritation does not rule out perforation and therefore cannot be relied on. While common sense and good judgment must be exercised, in general it is safer to make an exploratory laparotomy than to explore the wound locally or to await the development of untoward symptoms. Even in small wounds high up in the right side in the region of the liver, exploration is usually advisable.

The incision used should depend to a considerable extent on the nature and site of the wounds of entrance and exit. If the wound is large and associated with lacerated tissues, it should be debrided and extended to allow access to the peritoneal cavity. If it is small, it is disregarded or debrided locally and one of the accepted incisions for exploration of the abdomen used.

The exact procedure to be followed after the abdomen is opened varies with the character and location of the injury. In many instances, with extensive hemorrhage, the first and most important step is to find the bleeding point and stop the loss of blood. In others, bleeding is less active and control of spilling of gastrointestinal contents is more important. As a rule, with a patient under general anesthesia, continuation of spilling of gastrointestinal contents ceases except when viscera are manipulated, so that usually the control of hemorrhage is the first step. This may at times be difficult, for often the point of the bleeding is either retroperitoneal or between folds of mesentery, so that a spreading hematoma is present and the actual bleeding vessel may be hidden by the extravasated blood. This has to be squeezed out or expressed after incision of the peritoneal surface so that the actual bleeding point can be seen. After control of hemorrhage the next step is a complete and thorough examination of the entire gastrointestinal tract, literally from the cardiac end of the stomach to the rectum. A systematic inspection is essential in order to be certain that no perforations are overlooked, for failure to find and close just one hole may lead to fatal complications. One can be guided, of course, by the location of the wounds of entrance and of exit, but it is often surprising to find perforations where they would not have been expected from the location of the wounds of the abdominal wall. Perforations are most likely to be overlooked on the posterior wall of the stomach, in the duodenum and at the junction of the small bowel with its mesentery. In this last location the perforation may be obscured by a hematoma which must be evacuated completely so that careful inspection is possible. Perforations on the free serous surfaces of the bowel are usually easy to recognize and each one must be carefully closed. This is usually done with mattress sutures of fine silk with the suture line at right angles to the long axis of the bowel. By this method it is possible to turn in surprising amounts without unduly constricting the lumen. At times the bowel is so badly perforated or

its blood supply so torn that resection is necessary. This can be quickest repaired by dividing the bowel between Kocher clamps and doing an end to end anastomosis. Brush burns and bruises of the bowel caused by bullets usually need to be inverted even though no actual perforation is present at the time, for such areas may undergo gangrene and perforate if this is not done.

In wounds involving the lower part of the abdomen, special attention needs to be paid to possible perforation of the bladder or section of the ureter. If there is one hole in the bladder there is usually a second one which may be hidden extraperitoneally. Wounds in the bladder need to be sutured and a retention catheter then placed in the bladder after the operation is concluded. If a ureter is partially or completely severed, it may either be anastomosed or the proximal end implanted into the bladder and the distal end tied off.

Wounds involving the spleen usually require splenectomy. Wounds of the kidney occasionally demand nephrectomy, but this should be done only in case of almost complete destruction of the kidney or uncontrollable hemorrhage. As a rule the bleeding can be controlled by suture or packing. Nephrostomy may be necessary if the pelvis is badly damaged. Wounds of the liver, if small, require no treatment. In larger wounds, suture may be used to control bleeding. If the wound is quite large, it may be necessary to resort to a pack, which is brought out as a drain. Rarely the gallbladder is injured and needs to be removed. Wounds of the pancreas require drainage. Recently Naffziger and McCorkle [1] pointed out the value of the serum amylase test in the diagnosis of wounds of the pancreas and also as an index of progress after operation.

After seeing that all wounds of hollow viscera are closed and that major bleeding is controlled, one must consider the toilet of the peritoneal cavity. Foreign bodies, such as bits of clothing, or gun wadding, must be removed. Liquid contents of the stomach or bowel are removed as completely as possible with an aspirator. If solid fecal matter has escaped from the sigmoid or rectum it is removed as completely as possible, but unless it is found in an isolated area such as the cul-de-sac which can be washed out completely, irrigation is not used as it tends to spread the contamination rather than to wash away infective material. As a rule no drains are placed into the peritoneal cavity unless a pack or drain is necessary to control bleeding or unless the pancreas has been injured or the retroperitoneal space is contaminated. If possible, drains are brought out through a separate incision, often in the flank.

The management of viscera protruding through a penetrating wound requires special care. Any protruding mass is gently but thoroughly irrigated with isotonic solution of sodium chloride and covered with sterile gauze before the abdomen is opened. The skin up to the edge of the wound is washed thoroughly with soap and water and painted with skin disinfectant, as is the rest of the abdominal skin. If the protruding mass is omentum it may be grasped with a clamp or have a suture placed in it. Once inside the abdomen, the omentum can be divided and the protruding part pulled out by the nurse and discarded. If bowel protrudes, it is, of course, drawn back into the abdomen.

Before the abdomen is closed sulfanilamide is dusted into the peritoneal cavity, 5 or more grams being used up to a maximum of about 8 to 10. It is well established that the intraperitoneal use of the sulfonamide drugs gives more favorable results in the contaminated peritoneal cavity than when frank peritonitis exists, and this is the situation most commonly present in penetrating wounds of the abdomen. As may be expected, therefore, the mortality rate in this type of injury has been substantially lowered with the introduction of the use of these drugs. The use of sulfonamide drugs intravenously before operation and their continued use after operation are being carried out routinely at some clinics. Our experience with preoperative sulfonamide drugs is still too scant for an opinion to be expressed. As a rule, no sulfonamide drug is placed in the laparotomy wound itself, as this has proved of little or no value in improving results or in reducing the incidence of complications. At the Cincinnati General Hospital the wound is closed with through and through silver or steel wire sutures according to the method described by Reid and Zinninger,[2] no other sutures being used. Some operators prefer to use a continuous suture of catgut to close the peritoneum, but I myself prefer to use no suture except the through and through wires and a few fine silk sutures in the skin. This method allows a very rapid closure even when there is considerable tension. It leaves little or no foreign body in the wound and allows secretions from the wound to escape between the sutures. It is very secure and prevents disruption of the wound even when there is considerable infection present.

After operation a tube is passed into the stomach for continuous gastric suction. With an intratracheal tube in place the gastric tube can be easily passed by the anesthetist while the abdomen is still open and properly located by the surgeon in the stomach. Otherwise the tube may be passed as soon as the patient reacts from anesthesia. The decompression afforded by the immediate use of gastric suction tends to place the bowel at rest and prevents distention, which might result in undesirable tension. The length of time it remains in place depends on the number and character of the perforations, on the general postoperative course and on the amount of fluid obtained through the tube. In patients progressing satisfactorily it is usually removed at the end of forty-eight to seventy-two hours, and liquids are then started in small amounts by mouth. Prior to this time all fluid and food are given parenterally as intravenous dextrose solution, amino acids, blood or blood plasma. In most cases sulfadiazine is given either intravenously or subcutaneously during this same period, with blood levels being determined every other day. Complications have to be treated as they develop, the most common being pulmonary atelectasis, pneumonia, wound infection, peritonitis and intra-abdominal abscess. If recognized and treated promptly, atelectasis can usually be prevented from becoming a serious complication. We have found that postural drainage and urging the patient to cough up the occluding plug is usually effective if applied promptly. The

1. Naffziger, Howard A., and McCorkle, H. J.: The Recognition and Management of Acute Trauma to the Pancreas with Particular Reference to the Use of the Serum Amylase Test, read before the American Surgical Association, May 13, 1943.

2. Reid, M. R.; Zinninger, M. M., and Merrell, Paul: Closure of the Abdomen with Through and Through Silver Wire Sutures in Cases of Acute Abdominal Emergencies, Ann. Surg. **98**: 890-898 (Nov.) 1933.

technic used at the Cincinnati General Hospital was described by Moore [3] several years ago and is still in use today.

During the past fifteen months we have treated 46 cases of penetrating wounds of the abdomen, 9 of which were combined wounds of the chest and abdomen. There were five deaths in this series, giving a mortality rate of a little less than 11 per cent. Two of the patients who died had gunshot wounds of the vena cava. Three were due to pneumonia or empyema, 2 of the patients having combined abdominal and thoracic injuries. This mortality rate is considerably lower than that which obtained several years ago and is due, it is believed, principally to improvements in anesthesia, to the use of adequate amounts of blood and plasma, to the use of continuous gastric suction postoperatively and to the introduction of the sulfonamide drugs.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. ALTEMEIER, SILER, CALDWELL, EVANS, HOXWORTH, MCGRATH AND ZINNINGER

DR. SUMNER L. KOCH, Chicago: Altemeier has rightfully emphasized the importance of prompt arrest of bleeding in the care of wounds. It is sometimes forgotten that rapid hemorrhage takes place also from the surface and into the subcutaneous tissues after an extensive burn, and that this "white hemorrhage" is the most important factor in the production of secondary shock. To neglect local treatment of the burned area until shock has been controlled is analogous to permitting uncontrolled bleeding from an open wound until shock has been overcome. In the care of the lacerated open wound, one would agree that complete excision of the entire open contaminated wound is the ideal procedure but I realize from long observation of my own cases and those of others that it is difficult and often impossible to accomplish. The surgeon who attempts to excise *en masse* a contaminated wound too often after careful excision of ragged skin edge and crushed muscle finds himself confronted with crushed and contaminated tendons, nerves and bone fragments in the depth of the wound. To cleanse these essential structures and render them suitable for repair without recontaminating the freshly exposed skin, subcutaneous tissue and muscle is quite impossible even for the most skilful surgeon. Better results will be obtained both by the beginner and by the experienced surgeon by careful primary soap and water cleansing of the wound and excision of devitalized tissue after cleansing is completed. To say that prolonged wound washing is more likely to lead to infection than minimal cleansing is to overlook the fact that prolonged wound cleansing is inevitably carried out after extensive, badly contaminated and crushing injuries—the very type in which healing by primary union is most difficult to attain. With reference to infection of the hand, one would agree that prevention of infection by immediate and well considered treatment of open wounds is much more helpful than cure, once infection has developed. In the presence of infection one cannot stress too emphatically the importance of deciding at the outset whether an infection is a diffuse spreading invasive process or a localized infection. The treatment of the first type consists of rest, elevation of the part, application of large warm wet dressings and abstinence from active surgical treatment. It is for this type of infection that the sulfonamides have proved of undoubted value. It is in this type also that early surgical incision can prove disastrous and result in rapid and serious extension of an infection which might resolve or be converted into a localized process by wise and conservative management. I would like also to support Siler's advice to employ conservative treatment in the presence of osteomyelitis, whether associated with felon or secondary to other types of infection of the hand. With reference to frost bites, it is my belief that the changes in the tissues, though slower to occur, are identical with those resulting from excessive heat and that the same principles of treatment should be applied—gentle cleansing, an adequate compression dressing and a splint.

DR. WILLIAM DARRACH, New York: The main purposes of the first treatment should include reduction of displacement with the decontamination of the wound and the arrest of hemorrhage. The original operation is the best time to get satisfactory alinement and perhaps the only chance to obtain an accurate restoration of length and axis. Dr. Caldwell's indications for débridement are susceptible of misinterpretation. Although many fractures, compounded from within, need merely skin margin excision, many others with more than minimal soft part laceration and undermining of skin require more extensive débridement. Rifle and machine gun wounds may be handled conservatively, but those caused by shell and bomb fragments require full exploration. Thorough débridement is often indicated when his description does not apply, namely "when the wound is large, obviously contaminated and is bleeding freely or fragments are extensively contaminated." The time elapsed between receipt of injury and the first operative treatment should be mentioned. Thorough débridement is applicable only during the early hours. After eight or twelve hours, when contamination has become infection, operative extension of the traumatized area must be limited. I disagree with Dr. Caldwell's objection to the use of metal internal fixation in compound fractures. I so thoroughly agree with his statement that "any movement of the fragments in tissue which still harbors bacteria may traumatize the tissue sufficiently to activate subsiding bacterial proliferation" that I feel every effort should be made to obtain rigid fixation. The latter does control infection as well as maintain length and axis. If the injured bone can be covered by soft parts without tension, it will save weeks of convalescence; but unwise closure may lead to extensive infection and serious complications. Some of the deciding factors are the site of injury, the time elapsed between trauma and primary operative treatment, character and amount of contamination, condition of patient and postoperative transportation. Serious infection is far less likely to develop in upper extremity cases than lower, thigh less than leg. Perhaps the worst are the lower leg cases in which the tibia has little muscle attached to it and therefore poorer blood supply.

DR. FRANK L. MELENEY, New York: I wish to discuss that phase of Dr. Altemeier's paper on bacteriology which deals with the degree and nature of the bacterial contamination. The bacteria are introduced into the wound by the instrument causing the wound, by carrying in foreign bodies which are attached to the instrument itself, in the clothing covering the victim or on or in his skin. If the missile comes directly from a gun and has a smooth surface, it may be relatively free from bacteria; but if it has a rough surface and if it enters the wound after contact with the soil—such as a bomb or shell fragment—it may carry in large quantities of bacteria. Every wound is contaminated with bacteria to a greater or lesser degree. There will be many different species. However, the organisms are concentrated in or on the foreign bodies and at the time of contamination are not generally distributed throughout the wound. Any attempt, therefore, to take cultures of the wound in an effort to find out what organisms are there cannot depend on introducing a swab into one portion of the wound or even rubbing it extensively over the surface. In order to find out what organisms are present, it is necessary to remove as much of the injured tissue and foreign material as possible and cultivate all of the material removed. The preliminary treatment of such a wound in an effort to prevent infection should have as its main purpose the removal of as many of the contaminating organisms as possible. If the wound is seen soon after the accident and the organisms are still on the surface, the débridement does not need to be as extensive as is necessary at a later stage when organisms may have multiplied extensively and may have invaded the tissues. The débridement should be primarily a dry débridement, removing the damaged tissue and foreign bodies by excision without preliminary washing of the wound, for washing may disperse organisms into the remote nooks and crannies of the wound. A different set of instruments should

3. Moore, A. E.: The Treatment of Postoperative Pulmonary Atelectasis, Surgery **5**: 420-435 (March) 1939.

be used for débridement of the deeper portions of the wound. While the bacteriologic analysis of all the debrided tissue, in a manner such as described, invariably yields positive cultures, there may still be organisms left in the wound which are not represented in the debrided tissue. It has been found not infrequently that organisms develop infection in such wounds which were not originally found in the debrided tissue—even in cases which have been completely closed after débridement. I am sure that out of the war experience there will come a clearer knowledge of this important subject which Dr. Altemeier has called to our attention.

DR. DONALD MUNRO, Boston: The emphasis Dr. Evans lays on scalp wounds, his directions for diagnosing a compound fracture by palpation, the importance of making exploratory diagnostic trephinations not only in the temporal areas but in the occipital and perhaps cerebellar regions as well and his advice to the general surgeon to leave such technical specialties as the débridement of the brain to the trained neurosurgeon are all valuable points. I am sorry that he did not devote more space to the diagnosis and treatment of the nonoperable group of cerebral injuries. Except in actual combat these make up about two thirds of all craniocerebral injuries. He might have sacrificed his discussion about the much debated cause of concussion. This is the more true because recently (October 1943) and within six months of the presentation of Evans's paper new evidence on this subject has been presented from Oxford, England. This strongly suggests that acceleration and deceleration do not cause this pathologic entity. Instead it is stated that sheer strains set up by the different effects of rotational forces on the skull and brain are the etiologic factors regardless of forward or arrested movement of the head. I agree with Dr. Evans's definitions of the nonoperable cerebral injuries and in particular wish to draw attention to his definition of concussion. I think that there is some lack of logic in the description of the treatment that is recommended. This failure to class cerebral edema as a condition meriting more than incidental attention does not justify the evident care and thought he has given to its treatment. Furthermore, though he recognizes the pathologic importance and possible malign influence of increased intracranial pressure he neglects to include in his therapy measures looking toward its correction and, indeed, refers to lumbar puncture and its therapeutic effect in such a way as to create the impression that he does not advocate its use. This, together with his doubts as to the effectiveness of dehydration therapy by hypertonic solutions, leaves one wondering just what active treatment is to be used in these cases. I am sure that he knows that the treatment not only of contusion but also of edema and laceration of the brain has had for a number of years a solid factual foundation. I am sure that depressed fractures which overlie large vascular channels should, if possible, be left alone. They are not a fracture of which it is "particularly true" that elevation is required. Fatal hemorrhage with or without air embolus is too common a complication, especially when the operation is performed by the occasional neurosurgeon who fails to recognize the vital importance of curing the associated cerebral injury first. Nor do I feel that the therapy of compound fractures is as simple as is indicated here. It has been proved pathologically by Leary and Edwards that the arachnoid contributes no cells to the formation of the fibrous capsule that grows around a solid subdural hematoma. They are derived entirely from the dura. I am not aware that fluid is present in the normal cerebral subdural space. What is of importance, however, is the author's statements that "it is usually from such vessels as these (the larger cortical bridging veins) that subdural accumulations of blood occur" and "that sometimes they (such subdural collections) are secondary to laceration of the brain." These statements have been shown to have no basis in fact and are mere repetitions of earlier statements that were originally made on inadequate evidence. Recent detailed study of 310 cerebral and cerebellar subdural hemorrhages of all kinds and ages has demonstrated that the recognition of a ruptured bridging vein as the source of a subdural clot is so rare and so difficult as to make this a negligible consideration in the discussion of the etiology of this condition. On the other hand, two thirds of these patients had hematomas which were proved to have originated with a contused or lacerated brain. I have had 1 and probably 2 patients die as the result of recurrent extradural clots that arose from a torn middle meningeal artery the proximal end of which had previously been "closed" at operation by the electrocautery. I am sure that the electrocautery should never be used for the purpose of closing the bleeding stump of a ruptured artery.

DR. MAX M. STRUMIA, Bryn Mawr, Pa.: Dr. Hoxworth has rightly emphasized the necessity for supportive treatment of wounded persons beyond the immediate needs of fluid replacement therapy designed to combat shock. In estimating the requirements of a wounded patient for plasma in particular and for proteins in general, the previous state of nutrition is an important factor. Preexisting hypoproteinemia greatly alters the requirements and, if severe, may defeat the therapeutic efforts unless large doses of the material are employed. Proper emphasis has also been placed on the prevention of shock in the presence of conditions likely to act as initiating elements. The routine administration of 5 per cent dextrose in isotonic solution of sodium chloride to patients in shock before plasma or blood is given does not appear justified. Particularly objectionable is the recommendation that it be given fairly rapidly. It is desirable to utilize the time required to make plasma available (less than one-half hour) in starting the venoclysis with saline-dextrose solution, but this should be administered at the slowest possible rate, just enough to maintain the needle open. Even 500 cc. of saline solution administered in ten minutes may be an excessive amount for a patient in or near shock, as it will increase rapidly the blood volume and consequently the filtration pressure, at the same time lowering the oncotic pressure. Under these conditions plasma protein losses are likely to be increased, particularly in the damaged tissues. I prefer estimating hemodilution and hemoconcentration by the variations in the hemoglobin content rather than by the hematocrit. The hematocrit determination is generally more difficult to obtain, requires the use of a centrifuge, at least one-half hour time and, unless skilful operators carry it out, offers a greater opportunity of error. A determination of the hemoglobin content is, on the other hand, readily done in a few minutes and, unless a blood dyscrasia exists, the figures obtained may be readily translated in hematocrit values. In addition, satisfactory apparatus for the determination of hemoglobin is usually at hand in all laboratories. After using for over one year the Kagan apparatus for the determination of plasma protein, employing the falling drop principle, I have abandoned it and given the preference to the biuret method. While the former method requires less technical skill, it is more subject to uncontrollable variations, whereas the latter method is more accurate and, above all, more dependable. Only parenteral administration of fluid is mentioned. It might be well to remember that if water can be taken by mouth it should be so administered not only because it is safer, simpler and cheaper but also because it is more pleasant to take.

DR. WILLIAM DEW. ANDRUS, New York: If the patient is in severe shock but has survived the injury for an hour or more, a short delay in order to treat the shock may make the patient better able to survive operation. The dictum that unless penetration can be ruled out, and this is extremely difficult, operation is definitely indicated is one of the most important in dealing with such patients. When one considers the area of the peritoneum and the extent of the contamination which commonly occur in such wounds, the powers possessed by this membrane of overcoming infection are all the more striking. This power exists, however, only when the source of infection is cut off or removed. Thus, when all the perforations of the bowel are closed, the chief consideration in removing intestinal content is how much can be done with a minimum of trauma. The methods suggested, i. e. aspiration and removal of only such material as can be done with minimal trauma to the peritoneum, usually suffice. I have had the opportunity of repeating exploration on 2 patients on whom I had operated for gunshot wounds of the abdomen. At the time of the first laparotomy there was

the grossest contamination of the entire peritoneal cavity, which contained not only blood and feces but several kinds of food particles which had been ingested an hour previously. No attempt was made to remove anything from the peritoneal cavity, the operation consisting solely in closing the holes in the stomach and small and large bowel. Both patients recovered without complications, and, at the second laparotomy a year later, except for a few filmy adhesions the peritoneum was everywhere smooth and glistening, striking evidence of its recuperative powers. Like Dr. Zinninger, I have almost never inserted drains in such cases, using through and through sutures of silver wire to close the incision. Wounds of the pancreas introduce a further complication, however, and here the insertion of one or two cigaret drains through the gastrocolic omentum for a day or longer, if drainage is copious, may provide an additional factor of safety. I am particularly glad that Dr. Zinninger has stressed the use of intratracheal anesthesia, since in these cases, in which operation must often be carried out while the patient's stomach contains considerable amounts of food and vomiting is almost the rule, it is important to be able to keep the respiratory tract free by means of suction if necessary. After operation continued vigilance may often discover atelectasis early when the use of appropriate measures can usually clear it up and avoid or minimize the subsequent progress toward consolidation. The decreased mortality rate mentioned by Dr. Zinninger as due to improvements in anesthesia, adequate blood replacement, decompression of the bowel and chemotherapy, if maintained, will constitute a very considerable advance over the results of treatment of such wounds in the last world war.

Dr. W. A. Altemeier, Cincinnati: One of the most important factors influencing the development of infection is the treatment received by the wounded patient. I wish to emphasize again that the successful treatment of wounds is dependent primarily on the fulfilment of the fundamental principles of surgical treatment.

Dr. Joseph P. Evans, Cincinnati: I devoted special attention in my paper to the question of cerebral concussion because the work of Denny-Brown and Russell has offered for the first time a satisfactory experimental explanation of the phenomenon of concussion. The Oxford paper to which Dr. Munro refers is no doubt that of Holbourn (*Lancet* **2**:438 [Oct. 9] 1943), which does not "strongly suggest that acceleration and deceleration do not cause this pathologic entity" but rather offers a refinement of the original contention, for Holbourn points out that the production of sheer strains by rotational movements of the brain are apparently of considerable importance in the production of concussion. Rotation of the brain manifestly dependent requires acceleration or deceleration for its production. Dr. Munro is critical of my lack of enthusiasm for spinal drainage and for the use of hypertonic solutions in the treatment of cerebral edema and contusion. I have yet to be convinced that these forms of "active treatment" materially improve the patient's chances for recovery of physical and mental well-being. Until more fundamental investigative work is carried out on the physical and chemical alterations occurring in the brain in cases of head injuries, we shall continue to judge our results on a purely empirical basis, each advocate of a particular method serving as his own judge. I think his emphasis on the dangers of elevating a depressed fracture lying over a large sinus is proper. Such cases are better not undertaken by the occasional neurosurgeon and in some instances may better be left alone. The statement that a small amount of fluid is normally present in the subdural space is based on experimental work on dogs done by Penfield (*Am. J. Dis. Child.* **26**:383 [Oct.] 1923; *Anat. Rec.* **28**:173, 1924), who froze the intact skull, cut it serially and demonstrated the presence of small numbers of frozen yellowish crystals which on analysis proved to have a high protein content. The same experiment has not been done on man, but it seems a fair presumption that similar small amounts of fluid exist there. Munro and I are in agreement concerning the formation of the subdural hematoma capsule from dural rather than arachnoidal elements. Dr. Munro and I are far from being in accord as to the source of the bleeding in cases of subdural hematoma. He challenges my statement that "it is usually from such vessels as these (the larger cortical bridging veins) that subdural accumulations of blood occur," and he goes on to say "These statements have been shown to have no basis of fact and are mere repetition of earlier statements that were originally made on inadequate evidence." This represents, I believe, a change in the Boston City Hospital point of view. Thus, Leary (The Journal, Sept. 22, 1934, p. 897) wrote, concerning the source of the hemorrhage: "It is evident that hemorrhage in the subdural space can arise from the rupture of vessels anywhere in the structures abutting on or lining the cavity. . . . In skull fractures, laceration and contusion of the brain is the usual source. . . . In cases unassociated with fracture of the skull or evident brain damage, it is impossible to determine the source of the hemorrhage if time enough has elapsed to obscure or heal the bleeding vessel. In the cases accompanied by rapid death in which the blood is found still fluid at autopsy, a search for the source is more fruitful. In 8 cases I have been able to find the bleeder, which in 5 cases was a torn bridging vein and in 3 cases a vein at the surface of the arachnoid." While 12 of the 50 cases studied by Leary were not proved to have been due to trauma, only 2 were obviously due to other causes. I believe that in some instances blood is poured into the subdural space from contused or lacerated brain tissue, but I was surprised to learn that of 310 cases studied by Dr. Munro two thirds presented hematomas which were proved to have originated with a contused or lacerated brain. My own experience fails to coincide with these conclusions. For six years the neurologists and neurosurgeons at the Cincinnati General Hospital have cut brains once a week, including practically all the cases of head injury coming to autopsy at that hospital. While we do not have figures to bear out our contention, neither Dr. Charles Aring nor I, nor Dr. Mark Scheinker, who for the past two years has served as the neuropathologist in our unit, believes that the incidence of subdural hemorrhage dependent on cerebral contusion or laceration is anything like so high as suggested by Dr. Munro. However, that is a point which future work will have to elucidate. Dr. Munro's contention that the electrocautery should never be used for the purpose of closing the bleeding stump of a ruptured artery is no doubt a sound one. In view of the back bleeding that may occur from anastomotic vessels, I believe it would be sound to advise not only the mechanical rather than thermal closure of the middle meningeal vessel at the foramen spinosum but the additional safeguard of coagulating any other bleeding points which may tend to persist following the closure of the main stem of the vessel in the manner suggested by Dr. Munro.

Dr. Paul Irwin Hoxworth, Cincinnati: Dr. Strumia objects to rapid administration of dextrose and saline solution to patients in shock as a preliminary to plasma transfusion. Most experimental evidence clearly supports the reasons he supplies for his objections. Nevertheless, in practice, almost uniformly one sees immediate improvement in the patient after such administration. While we know this to be only a transient improvement in most instances unless followed by plasma or blood, it is gratifying and, if followed immediately by adequate amounts of plasma, any improvement gained is generally maintained. Amounts of electrolyte solutions up to 500 cc. are probably utilized rapidly by the patient after plasma transfusion is begun. The initial intravenous injection in these cases should be made with plasma, but this is difficult in actual practice. The choice of laboratory methods for estimating hemodilution, hemoconcentration and plasma or serum protein content must depend not only on the method but on the technician's skill, his acquaintance with the method and the facilities available for performing the test. Parenteral routes were devised only as substitutes for enteral routes for fluids. Oral administrations should be reestablished as early as it is practicable. Even if fluids can be taken by mouth, they should be withheld routinely in the management of wounded persons, however, until it is made certain that general anesthesia is not to be employed early.

Dr. W. E. Adams, Chicago: Injuries of the chest accounted for 20 to 30 per cent of the dead picked up on the battlefield in World War I. The early mortality of those escaping immediate death was approximately 25 per cent. This explains why

only 4 to 8 per cent of the wounded admitted to the clearing stations were because of this lesion. Unless these cases receive early adequate management the mortality will be especially high. One of the chief factors responsible for the high death rate in this injury is internal hemorrhage from wounds of the heart, one of the great vessels or vessels of the chest wall. A second important factor is the disturbance of cardiorespiratory function by alteration of intrathoracic pressures. Either of these conditions, unless quickly remedied, may lead to an early death. The principles which Dr. McGrath has outlined for treatment, when followed, will save many lives. The important fact is that this management must be carried out early and continuously, for the condition of these patients may change from one ten minute period to another. Therefore they must be followed almost constantly until their condition is stabilized. One type of injury that has been mentioned frequently in reports of casualties of World War II might receive additional emphasis, namely the "stove-in" chest wall. In this injury a portion of the chest wall becomes mobilized by virtue of several ribs having been fractured at two sites by a crushing blow. Thus with each respiratory effort this portion of the chest wall moves inward and outward. With this action the efficiency of the respiratory effort is reduced in a way that is similar to that seen in large open sucking wounds of the chest wall. Emergency management entails the stabilization of this portion of the chest wall by adhesive strapping until adequate management can be obtained.

DR. M. M. ZINNINGER, Cincinnati: The only additional comment I wish to make is that the mortality rate at the Cincinnati General Hospital has remained fairly stationary. Since the paper was written a number of additional cases have been studied. The series at present consists of 71 cases with 8 deaths, a mortality rate of approximately 11 per cent.

GALLSTONES

HOW FAR MAY WE GO IN POSTPONING OPERATION?

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BOSTON

To what extent may we expect delay in surgical intervention to contribute to complications in gallstones? This question, pertaining to approximately 10 per cent of the population,[1] is particularly pertinent at this time. Before World War II patients could be operated on promptly and at will even for symptomless gallstones. Today patients cannot be so favored. The improved economic status of the public and the popularity of group hospitalization insurance have created an unprecedented demand on hospitals for private accommodations. Hospital beds and nursing services must be conserved. Over 36,000 nurses have already gone into the armed services, and the Red Cross has agreed to recruit an equal number by June 30, 1944.[2] Moreover, there is greater validity today in the patient's argument that he or she cannot surrender present duties and responsibilities of an essential occupation or of a household without help. As a result, operations for gallstones without biliary complications, even if giving rise to troublesome symptoms, may have to be postponed.

In an attempt to evaluate the probable effects of deferment of operation in cholelithiasis, an analysis was made of 253 consecutive private cases of operation for gallstones. The patients were all white between the ages of 14 and 77. The average duration of symptoms for the series was 5.1 years, as shown in the accompanying table. One hundred and fifty-three (61 per cent of the series) had symptoms attributable only and directly to the cholelithiasis; the average duration of these symptoms was 4.6 years. The remaining 100 (39 per cent of the series) had the following complications: acute cholecystitis, common duct stones, acute pancreatitis, carcinoma of the gallbladder and diabetes.

Average Duration of Symptoms of Gallstones Before Operation

(1)	253 cases	5.1 years
(2)	153 cases without biliary complications	4.6 years
(3)	100 cases with biliary complications	6.7 years *
	Acute cholecystitis	4.9 years
	Acute pancreatitis	3.9 years
	Choledocholithiasis	5.6 years
	*Diabetes	9.6 years
	*Carcinoma of the gallbladder	24.3 years

* Excluding diabetes and carcinoma, the average duration of cases with biliary complication was six years.

The average duration of symptoms in this group was 6.7 years, or 2.1 years longer than for those without complications.

Acute cholecystitis, including empyema, gangrene and perforation of the gallbladder was encountered in 68 patients (27 per cent of the series). The average duration of symptoms in these cases was 4.9 years, or four months longer than in those without complications. Approximately one third of these 68 patients, however, developed acute inflammation within one year of the onset of symptoms; in fact, the first evidence of gallstones in 5 of these patients was an attack of acute cholecystitis.

Acute pancreatitis was found in 10 patients (4 per cent of the 253), 6 having edema of the pancreas and 4 having acute hemorrhagic pancreatitis with fat necrosis. The average duration of symptoms was 3.9 years, or eight months less than the average for the uncomplicated cases. Five had symptoms for less than one year, and 2 had but one attack. Acute pancreatitis, therefore, like acute cholecystitis, may occur either early or late in the presence of gallstones and may even be the first evidence of biliary calculi.

Stones in the common duct were removed in 30 cases (12 per cent of the 253), in 3 of which there were no stones in the gallbladder. Acute pancreatitis also was present in 2 of this group, acute cholecystitis in 9 and carcinoma of the gallbladder in 2. Although the average duration of symptoms for the common duct cases is about one year longer than in the uncomplicated cases, there were attacks for less than one year in 9 cases (30 per cent of the 30), including 3 in which but one attack occurred.

Five patients (2 per cent of the 253) had concomitant diabetes. All were over 40, and the average duration of symptoms was 9.6 years, or five years longer than the average for uncomplicated cases. It has been stated that the incidence of complications of gallbladder disease "is considerably greater in the diabetic than in the nondiabetic."[3] One of these diabetic patients developed acute cholecystitis after having had symptoms of gallstones for eighteen years, and another after four years of biliary symptoms came to operation with acute cholecystitis, common duct stones and acute pancreatitis. Whether the existence of gallstones is a

1. Warren, Richard, and Balch, F. G., Jr.: Carcinoma of the Gallbladder, Surgery **7**: 657 (May) 1940.
2. Wartime Nursing Is Different, J. A. M. A. **123**: 99 (Sept. 11) 1943.
3. Eisele, Harold E.: Results of Gallbladder Surgery in Diabetes Mellitus, Ann. Surg. **118**: 107 (July) 1943.

factor in initiating or aggravating diabetes is a question.[4] It has been conclusively shown,[3] however, that the severity of a concomitant diabetes is not diminished by a cholecystectomy.

Three patients (1 per cent of the 253) had carcinoma of the gallbladder. Biliary symptoms were present before operation for periods of six, twenty-seven and forty years. Two of these patients also had common duct stones; they lived three and one-half months and two and one-half years, respectively, after operation. The third patient, aged 77, who presented extensive metastasis, died on the seventh postoperative day. Although there is no unanimity of opinion whether gallstones most commonly precede or follow carcinoma of the gallbladder, the weight of evidence favors the latter. The duration of symptoms in carcinoma of the gallbladder has been reported as varying from less than one month [1] to thirty years.[5] Since cancer of the gallbladder is found in only 1 per cent to 2.5 per cent of patients operated on for gallstones,[1] cancer as the result of postponement of operation for gallstones must be held to be only a remote possibility.

In addition to the death just recorded, there were 15 others in the series of 253 patients. Twelve patients —4 with biliary complication and 8 without—died from causes entirely unrelated to the biliary pathologic condition, namely pulmonary embolism, coronary occlusion, acute cardiac dilatation, wound rupture and evisceration, peritonitis and bronchopneumonia, any of which may follow an abdominal operation.

The remaining 3 fatalities were the only ones in the series in which death can be directly attributed to delay in surgical intervention. They were all in the group with biliary complications. The first patient was not seen until two and one-half days after the onset of the first and only attack of abdominal pain. At operation six hours later an open acute perforation of the gallbladder was found. Hemolytic streptococcic infection caused death on the seventh postoperative day. The second patient had had a cholecystectomy three years previously for acute cholecystitis and cholelithiasis. Symptoms recurred two and one-half years after operation and continued for six months before surgery was permitted. The patient came to operation in poor condition, with jaundice and clay colored stools. The common duct was found to be packed with stones. Urinary suppression developed after operation, and death occurred on the third postoperative day. The third patient had symptoms for two years before operation, recently increasing in severity. Surgery was accepted seven months after it was advised. The patient was jaundiced, with clay colored stools. Operation revealed empyema and gangrene of the gallbladder, suppurative choledochocystitis and several common duct stones. Death eleven days after operation resulted from septic peritonitis.

As desirable as it may be to operate for gallstones "before the development of advanced pathological conditions of the bile ducts, the liver, the pancreas and the vital organs," [6] it is not always possible. The ideal time to operate, of course, is before the patient has symptoms, but "silent stones" are found only incidentally at an x-ray examination or a laparotomy for some other condition. Patients are not generally seen by the surgeon until the symptoms have become severe enough to warrant the consideration of operative treatment. The longer the duration of symptoms before operation, the greater the likelihood of biliary complications, but how early these complications will arise in any individual case cannot be predicted. One analysis [7] shows an increase of common duct stones from 1.9 per cent in patients with symptoms for less than two years to 16 per cent for those with symptoms from ten to thirty-five years. On the other hand, another report [8] states that 46 per cent of patients with common duct stones gave a history of symptoms going back less than one year. In the present study approximately one third of those with common duct stones, one third of those with acute cholecystitis and one half of those with acute pancreatitis stated that their symptoms had existed less than one year. Moreover, complicating pathologic changes in the biliary tract may be present with the initial symptoms of gallstones; in this series 20 per cent of the patients with acute pancreatitis, 7 per cent of those with acute cholecystitis and 10 per cent with common duct stones had these complications with their first attack of abdominal pain. Some patients, however, have symptoms of gallstones for a protracted period and yet develop no complicating biliary pathologic condition. Of this series of 253 patients, 61 per cent had no biliary complications although they had symptoms averaging 4.6 years (one having reported attacks over a period of thirty-nine years).

SUMMARY AND CONCLUSIONS

It is evident that biliary complications may occur at any time in the presence of cholelithiasis. They may be present when the patient is first seen or they may not occur at all even when there are frequent attacks of colic over a long period of years. The presence of complications adds to the risk of operation and calls for prompt treatment. Early operation is likewise desirable for cholelithiasis without complications, since delay increases the likelihood of their occurrence. Operation, however, may be safely deferred in patients with gallstones so long as there is no evidence of complications and provided postponement is not so protracted that it may impair the patient's resistance to the operative procedure.

483 Beacon Street.

4. Joslin, E. P.: Relation of Trauma to Diabetes, Rocky Mountain Law Rev. **15**: 173 (June) 1943.
5. Magoun, J. A. H., and Renshaw, Kinsley: Malignant Neoplasia in the Gallbladder, Ann. Surg. **74**: 700 (Dec.) 1921. Warren and Balch.[1]
6. The Surgical Treatment of Gallstone Disease, editorial, J. A. M. A. **104**: 836 (March 9) 1935.
7. Heyd, C. G.: Gallbladder Disease: Consideration of Mortality, New York State J. Med. **41**: 1183 (June 1) 1941.
8. Lahey, F. H., and Swinton, Neil: Stones in the Common and Hepatic Bile Ducts, New England J. Med. **213**: 1275 (Dec. 26) 1935.

Involutional Melancholia.—Strecker suggests that human beings, like nations, have epochs in their lives during which they are exposed to serious hazards, incidental and epochal. At the epoch of the climacteric there are peculiar dangers and risks, both somatic and psychological. It is here that the period of regression may begin. The climacteric for men, as well as women, is an epoch of insecurity with a triple threat: somatic, environmental and the inner psychic turmoil. The sex ratio for involutional melancholia is about three women to one man. The age range in women is about 40 (or earlier if there has been an artificial menopause) to about 55. In men it extends from 50 to 65. Often the step from climacteric to psychosis seems rather short. The depression which occurs is as deep as, or deeper than, the depressive phase of manic-depressive psychosis; the self accusation is more pronounced and the suicidal trends more acute.—Davis, John E.: Principles and Practice of Rehabilitation, New York, A. S. Barnes & Co., Inc., 1943.

THE PRODUCTION BY MODERATE EXERCISE OF A HIGH INCIDENCE OF BENDS

AT ALTITUDES OF 26,000 TO 28,000 FEET

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It has generally been supposed that the bends and the chokes [1] occur infrequently or not at all at altitudes under 30,000 feet. According to Armstrong,[2] "With ascents at rates as high as 12,000 feet per minute up to 30,000 feet, symptoms are seldom noted even after prolonged stays at that altitude." The present report is concerned with demonstrating that this need not be the case and that under appropriate conditions bends equaling in incidence and severity those reported at altitudes above 30,000 feet may be produced in the low pressure chamber at altitudes as low as 26,000 feet.

SUBJECTS

Subjects participating in these experiments were all volunteers from this unit. It is believed that they represent a fair cross section of Air Corps enlisted personnel. All had passed the required modified "64 examination." Only one of these men was on limited service, and this because of defective vision. Thirteen were below the age of 30, the average age being 23. Five were 30 years old or over, the highest age being 34, the average being 32. The two officers were 30 and 36 years old. Sixteen of the 19 enlisted men had participated in high school or college athletics, 10 in baseball, 9 in football, 5 in basketball, 2 in track and 2 in boxing. The physical condition of the personnel of this unit was good by virtue of one or two hours of calisthenics and athletics a day. This is reflected in their average physical fitness rating of 47.5. A variety of physical types was represented in this group, as shown by height and weight measurements included in table 2.

With the exception of the officers, these men had not experienced nor had they seen bends and chokes prior to the chamber flights. There is no reason to believe that any prejudice existed as to the results or that psychic factors played an important or significant role. The average general classification score of the enlisted men was 108.

PROCEDURE

The oxygen masks used were the A-10 type and showed less than a 3 per cent leak according to the Scholander test. Before each chamber run the fit of the masks was checked by the "sniff" test. Pulse and blood pressure were checked at the start of each flight and again immediately after descent. At least two days elapsed between flights for any 1 person, and if bends had developed at least four days and usually more intervened between the flights. The majority of flights were started at 8 a. m., but 4 were started at 1 p. m. The chamber temperature for the flights varied between 68 and 88 F.

Pressure altitude was used throughout as indicated by three altimeters with Kollsman settings of 29.92. These altimeters agreed at the altitudes employed within 100 feet. With the exception of the first two flights the altimeters were covered so that the men in the chamber were unaware of their simulated altitude. The rate of ascent was 3,000 feet per minute except in one control flight. In the basic experimental flights the mask was connected to the regulator at 18,000 feet with the automix [3] set in the "off" position in an attempt to delay denitrogenation [4] during ascent and to accelerate it at altitude. Only slight symptoms of anoxia were produced in the ascent to 18,000 feet. On reaching the desired altitude each man did five deep knee bends and extended five times at arm's length a 14 pound high pressure oxygen cylinder held on the palms.

TABLE 1.—*Flight Conditions and Occurrence of Bends at Simulated Altitudes of 26,000 to 28,000 Feet*

Flight	Altitude, Ft.	Mask Plugged In, Ft.	Automix Setting[a]	Exercise	No. of Men	Grade 3 Bends[b] No.	Grade 3 Bends[b] %	Grade 2 Bends[c] No.	Grade 2 Bends[c] %
1 Ex.	28,000	18,000	Off	Yes	19	6	32	2	11
2 C.	28,000	10,000	On	No	17	1	6	0	0
3 Ex.	28,000	18,000	Off	Yes	17	7[d]	41	2	12
4 Ex.	27,000	18,000	Off	Yes	15	5[e]	33	2	13
5 C.	14,000	9,000	Off	Yes	17	0	0	0	0
6 Ex.	26,000	18,000	Off	Yes	14	3	21	2	14
7 Ex.	25,000	18,000	Off	Yes	17	0	0	0	0
8 Ex.	28,000	18,000	Off	No	17	0	0	2	12
9 Ex.	28,000	10,000	On	Yes	18	5	28	1	6

a. Automix "off" gives 100 per cent oxygen at all altitudes; automix "on" gives the appropriate mixture of air and oxygen at all altitudes.
b. Necessitating descent.
c. Descent not necessary.
d. Includes 1 case of grade 4 chokes.
e. Includes 1 case of grade 3 chokes.

These two exercises were repeated every ten minutes during the flight. In the majority of the cases two hours were spent at altitude; however, in three flights it was necessary to cut the time short to avoid interference with the indoctrination activities of the unit. The shortest time spent at altitude was one hour.

RESULTS

The typical symptoms of bends and chokes encountered were graded in accordance with the procedure employed at S. A. M., Randolph Field, Texas. Thus, grade 1 indicates transitory symptoms, grade 2 intermittent or continuous symptoms not requiring descent, grade 3 symptoms necessitating descent and grade 4 symptoms accompanied by general symptoms such as nausea, sweating or fall in blood pressure.

The order in which the flights were performed and the incidence of grade 3 and grade 2 bends are shown in table 1. Only 1 case of bends was encountered in the control flight to 28,000 feet (automix on at 10,000 feet, no exercise). No symptoms occurred in flight 5, which simulated the experimental flight to 28,000 feet except

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1. By bends and chokes are meant the pains produced in the long bones and lungs, respectively, as the result of decompression. These and other symptoms are presumably due to the formation of nitrogen bubbles.

2. Armstrong, H. G.: Principles and Practice of Aviation Medicine, Baltimore, Williams & Wilkins Company, 1939, p. 350.

3. Automix "off" gives 100 per cent oxygen at all altitudes; automix "on" gives the appropriate mixture of air and oxygen at all altitudes.

4. The elimination of nitrogen from the body by the reduction of the partial pressure of this gas either by increasing the altitude or by increasing the partial pressure of oxygen.

that rate of ascent and altitude were cut in half. It would appear that these two flights eliminate suggestion or a desire to cooperate as factors in the experimental flights. A further check on these factors is provided by flight 7 to 25,000 feet. At this altitude the incidence of bends was zero, but at 26,000 feet 21 per cent of grade 3 bends and 14 per cent of grade 2 bends occurred. At 27,000 feet and 28,000 feet grade 3 bends were encountered in from 32 to 41 per cent of the men. At these altitudes 35 per cent of grade 3 bends were produced in fifty-one man flights. This high percentage for two hour flights may be partially due to premature descents with discomfort that could have been tolerated for the duration of the flight. In the opinion of the observers there was little evidence to substantiate this supposition. In any case the frequency of grade 3 bends would hardly have been less than 20 per cent. There were 2 cases of chokes, which are included under grade 3 bends in table 1. These will be described in case histories.

TABLE 2.—*Individual Susceptibility to Bends at Simulated Altitudes of 26,000 to 28,000 Feet*

Flight No.						1	3	4	6	9
Altitude, feet						28,000	28,000	27,000	26,000	28,000
Name	Age	Height Ft.	Height In.	Weight	P. F. R.[a]	Grade Bends[b]	Grade Bends	Grade Bends	Grade Bends	Grade Bends
Huffstetler	24	5	8½	150	51	3	..	3	3	3
Krahe	20	6	1	170	43	3	3	3	..	3
Wolk	23	6	1	176	46	3	3	..	3	3
Callahan	20	5	11	210	46	3	3	0	3	0
Dunn	22	5	9½	195	50	3	3	Ch. 3	0	0
Lundeen	23	5	10½	158	45	0	3	2	0	3
Cimperman	25	5	11½	185	49	0	3	0	0	3
Riesen	30	5	10½	150	58	2	..	3	2	2
Bradley	21	5	10½	135	54	3	0	0	0	0
Dulligan	31	5	10	170	48	0	0	3	..	0
Jones	33	5	9	155	40	0	Ch. 4	..	0	0
Farkas	27	5	10½	185	55	2	2	0	0	0
Gardner	26	5	7½	165	35	0	2	0	2	0
Crocker	34	5	6½	165	54	0	0	0	..	0
Eastburn	31	6	1	200	36	0	0	..	0	0
Lazazzero	23	5	8½	150	50	0	..	0	0	0
Merrill	20	5	11½	150	46	0	0	..	..	0
Robinson	32	5	8	158	40	0	0	0	0	0

a. Physical fitness rating. Good, 47 to 63; poor, 34 to 46.
b. Grade 3 bends = pain necessitating descent; grade 2 bends = descent unnecessary.

The average time after reaching altitude to the appearance of the first symptoms that subsequently gave rise to grade 3 bends was forty-seven minutes. On the average the intensity of the pain was sufficient in ten minutes to indicate descent. This time varied from two minutes to one-half hour. The subjective symptoms of bends disappeared during descent at altitudes varying from 15,000 to 24,000 feet, with an average of 18,500 feet. The average chamber temperature at the time of the occurrence of grade 3 bends was 72 F. (from 67 to 88 F.).

The pain produced at altitudes above 25,000 feet was of the deep, sickening variety and in grade 3 bends was frequently associated with a loss of use of the affected members. Confined almost entirely to the joints of the long bones, the distribution of the subjective symptoms of grade 2 and 3 bends was knee 35, shoulder 7, wrist and hand 5, ankle 4, elbow 2, shin bone 2, hip joints 1 and upper arm 1.

Fourteen cases of skin sensations were reported by a total of 10 subjects. All but 2 of these cases were at 28,000 feet. Five were associated with the bends. The sensations were cold 6, heat 6, tingling 4, itching 2 and formication 2.

It is of interest to note that crepitation without pain occurred in the little finger of one of the officers at 28,000 feet. The gas bubbles were easily felt by another officer and 2 enlisted men.

Following the production of bends at 26,000 feet, attention was turned to the factors responsible for their occurrence. Runs were made at 28,000 feet first with denitrogenation delayed (mask plugged in with the automix in the "off" position at 18,000 feet) but without exercise; and, second, with the normal use of oxygen (mask plugged in with the automix in the "on" position at 10,000 feet) plus exercise. The results shown in table 1, flights 8 and 9, indicate that exercise was the primary cause of bends at 28,000 feet, the incidence of grade 3 bends being 28 per cent. The delayed denitrogenation alone produced no grade 3 bends and 12 per cent grade 2 bends. Whether or not the latter procedure increased the incidence of bends produced by exercise cannot be determined from the limited data available. Certainly it was not a major factor.

Individual susceptibility to bends (and chokes) on four or five bends producing flights at simulated altitudes of 26,000 to 28,000 feet is shown in table 2. The men have been arranged in descending order of their susceptibility to grade 3 bends. Within a group showing the same frequency of grade 3 bends, those individuals who developed grade 2 bends in addition have been placed at the top of the group. Excluding grade 2 bends and considering only grade 3 bends and chokes, the subjects fall into five groups. Three men developed these symptoms in all four of their flights. Symptoms in 60 per cent of their flights were shown by 2 men, in 40 per cent by 2 men and in 20 to 25 per cent by 4 men. Seven men had no grade 3 bends or chokes in three to five flights. Two of these 7 men experienced grade 2 bends in 40 per cent of their flights.

Seventeen of the men listed in table 2 have been divided into three groups, depending on whether the incidence of stage 2 or 3 bends or chokes during their first two flights to 28,000 feet was 0, 1 or 2. The occurrence of symptoms for men in these groups on subsequent flights (table 1, flights 4, 6 and 9) has been presented in table 3. The symptoms on the basis of man flights equaled 9, 29 and 59 per cent, respectively. But 1 man having bends in both of his first two flights was symptom free in his next three tests. Grade 2 bends symptoms were included in these calculations to circumvent the possibility that some grade 3 bends were in reality of grade 2 intensity. Applying the same procedure to grade 3 bends and chokes alone, the percentage of apparently incapacitating symptoms for the three groups was 6, 15 and 67 per cent.

The results suggest that no pronounced correlation exists between body build (as measured by height and weight) or physical fitness, and susceptibility to bends in this group. However, there does appear to be an inverse correlation between age and susceptibility. This possible absence and presence of correlation was

not subjected to statistical analysis, since such tests would be of very dubious significance in view of the limited number of men run.

CASE HISTORIES

Three case histories, two of chokes and one of bends, will serve to illustrate the severity of these reactions at altitudes below 30,000 feet.

Cpl. Jones developed a substernal pain, accompanied by coughing, after ninety minutes at 28,000 feet. Although the coughing was not violent, Cpl. Jones was removed to the lock and brought to ground level at 3,000 feet per minute. During descent he was very pale and appeared to be in considerable discomfort primarily because of difficulty in breathing. On reaching ground level his sitting blood pressure was found to be 80/60 as compared to 120/70 before the flight. Deep inspiration produced a sharp substernal pain. While the blood pressure was being taken, Cpl. Jones became nauseated and broke out in perspiration. The pulse was 65 as compared to a preflight pulse of 72. He was immediately placed in shock position. Five minutes later the systolic pressure had risen to 90 and the pallor, sweating and nausea had disappeared. He was taken by ambulance to the hospital, some 3 miles away, where his prone blood pressure was found to be 95/65. The chest pain on deep inspiration had disappeared. The corporal was hospitalized for twenty-four hours. He felt weak and tired for the remainder of the day but by the next day had completely recovered.

After 113 minutes at 27,000 feet it was observed that Sgt. Dunn was having difficulty in breathing. He insisted that he felt no pain, but when told to take a deep inhalation a sharp substernal pain was experienced. Later he admitted that his chest had hurt for ten or fifteen minutes. Four minutes later he became very pale and the chamber was dropped despite his protest. At the same time he coughed several times and then went into violent and alarming paroxysms of coughing. At 20,000 feet he tore his oxygen mask off and resisted all attempts of the inside observer to replace it. Two masks with the regulator emergency turned on were held close to his face. He broke out in a heavy perspiration and gestured for something in which to vomit (pulse 90). However, he did not do so. All the while the coughing was so severe that the observers feared asphyxiation might ensue. At 10,000 feet the coughing and nausea subsided and the patient was stretched out on the chamber seat with his feet elevated. At ground level the blood pressure was 125/76 and the pulse 84 (preflight blood pressure 108/70 and pulse 72). The pain produced by deep inspiration disappeared after one hour, but the chest muscles were sore for the remainder of the day.

On an experimental flight to 25,000 feet Cpl. Cimperman descended after fifty-eight minutes without symptoms. After four minutes at ground level he ascended at a rate of 5,000 feet per minute. Ten minutes later he developed severe bends in the right knee and was forced to come down. This case has not been included in tables 1 or 2.

SUMMARY

1. Moderate exercise and delayed denitrogenation in a flight of two hours' duration at 28,000 feet produced bends and chokes necessitating descent in 36 per cent of the cases. These symptoms occurred in 33 per cent of the men tested at 27,000 feet, in 21 per cent at 26,000 feet and in 0 per cent at 25,000 feet.

2. At 28,000 feet grade 3 bends was produced in 28 per cent of the men by moderate exercise alone. Delayed denitrogenation alone produced no grade 3 bends at this altitude.

3. In five bends producing flights (eighty-three man flights) at simulated altitudes of 26,000 to 28,000 feet for two hours the incidence of grade 3 bends was 29 per cent, of grade 2 bends 11 per cent and of skin sensations 17 per cent. Two cases of chokes, 1 accompanied by shock, occurred.

4. In 18 men making four or five bends producing flights the incidence of grade 3 bends or chokes ranged from 100 per cent in 3 men to none in 7.

5. In 17 men the occurrence or absence of bends (grade 2 or 3) and chokes on their first two flights was a good index of susceptibility or resistance to these symptoms on subsequent flights.

6. These results suggest that bends and chokes may occur in men required to perform moderate exercise in combat ships at altitudes as low as 26,000 feet.

ADDENDUM

Since the completion of this work, 9 of the men listed in table 3 have participated in indoctrination flights to altitudes of 26,000 to 30,000 feet. The rate of ascent was 3,000 feet per minute to an altitude of 18,000 feet, broken by a three minute stay at 10,000 feet, at which time the oxygen regulators were turned on and the oxygen masks applied. B. L. B. masks and constant flow regulators were used. Consequently the oxygen flow was manually adjusted in accordance with the altitude. After five to ten minutes at 18,000 feet the chamber was raised at 1,000 feet per minute to the maximum altitude employed.

TABLE 3.—*Predictive Value of Two 28,000 Foot Flights in Subsequent Flights at Altitudes of 26,000 to 28,000 Feet*

Incidence of Bends[a] in First Two Flights to 28,000 Feet								
0			1			2		
Name	No. of Subsequent Flights	Incidence of Symptoms[b]	Name	No. of Subsequent Flights	Incidence of Symptoms	Name	No. of Subsequent Flights	Incidence of Symptoms
Crocker.....	2	0	Lundeen....	3	2	Huffstetler..	2	2
Eastburn...	2	0	Cimperman.	3	1	Krahe.....	2	2
Lazzazero...	2	0	Bradley.....	3	0	Wolk.....	2	2
Robinson...	3	0	Jones.....	2	0	Riesen.....	2	2
Dulligan....	2	1	Gardner.....	3	1	Callahan....	3	1
						Dunn.....	3	1
						Farkas.....	3	0
Total.....	11	1	Total.....	14	4	Total.....	17	10
Per cent bends....		9	Per cent bends....		29	Per cent bends....		59

a. Grades 2 and 3 combined. b. Bends or chokes, grades 2, 3 or 4.

During these flights the men, who were acting as inside observers, performed no more exercise than is involved in giving a fifteen minute lecture while seated, and rising occasionally to turn on a regulator or adjust an oxygen mask. Nevertheless Dunn was seized with severe pains in his left shoulder after twenty-nine minutes at 26,000 feet. These pains were severe enough to necessitate descent. Bradley experienced grade 2 bends in the right elbow after five minutes at 28,000 feet and, although not incapacitating, the pain persisted until the flight was terminated fifty-eight minutes later. On the other hand Crocker, Lazazzero, Dulligan, Lundeen, Huffstetler, Callahan and Farkas (table 3) were symptom free in a total of eleven flights.

Also, since the completion of this work, it has come to our attention that other workers in this country and in Canada have observed bends as the result of exercise at altitudes well below 30,000 feet.

Clinical Notes, Suggestions and New Instruments

INFLUENZAL MENINGITIS IN BROTHERS

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Influenzal meningitis is generally considered to be a noncontagious sporadic disease of infants. The causative organism is Haemophilus influenzae, a gram negative bacillus described by Pfeiffer in 1892. Levinson [1] reports that from 79 to 80 per cent of cases occur in children under 2 years of age. The appearance of this disease in brothers aged 4 years and 2 years respectively, with an acute fulminating course and death within twenty-four hours of onset, is considered worthy of record as it emphasizes the potential contagious nature of influenzal meningitis. In a search of the literature the only other occurrence of the disease among siblings that we could find was that of a report by Davis [2] in 1909 in which he described influenzal meningitis in newborn twins. Both infants contracted the disease on the fifth day of life. One twin died on the ninth day of life and the other on the twelfth day. The mother was in good health, and no source of infection was found.

REPORT OF CASES

Case 1.—D. M., a boy aged 4 years, had previously enjoyed good health except for a recent mild upper respiratory infection that his mother described as a mild head cold. On Sept. 26, 1943 he attended Sunday school in the morning. That afternoon he complained of not feeling well. His temperature was found to be 102 F., pulse rate 130 and respiratory rate 50. There were convulsive movements of the face and upper extremities with pronounced rigidity of the neck and spinal column. Kernig's sign was questionably positive. The mucous membranes of the throat appeared normal. There was questionable redness of the left ear drum. The remaining examination showed nothing of note. Hemoglobin was 71 per cent (Sahli). The leukocyte count was 5,550 with 78 per cent neutrophils and 22 per cent lymphocytes. A spinal puncture showed a cloudy fluid with 3,260 cells. A differential count showed 93 per cent neutrophils and 7 per cent lymphocytes. A gram stain on the spinal fluid showed large numbers of pleomorphic gram negative bacilli. The spinal fluid sugar was less than 15 mg. per hundred cubic centimeters. The organisms would not grow on plain mediums. On chocolate blood agar and other enriched mediums they showed small translucent colonies. The bacteriologic diagnosis was Haemophilus influenzae. A specimen of spinal fluid was submitted to the Minnesota Department of Health, Division of Preventable Diseases. The report was as follows: "The fluid was clear on receipt. The Nonne test showed the presence of globulin. Direct smears showed many polymorphonuclear leukocytes and pleomorphic gram negative rods, which showed capsular swelling with Haemophilus influenzae, type B antiserums. Cultures show gram negative pleomorphic bacilli which grow only on blood enriched mediums and give a capsular swelling with Haemophilus influenzae, type B antiserums." The patient was started on sulfadiazine both orally and subcutaneously. He suffered from projectile vomiting. He grew progressively worse. The temperature at 12 p. m. was 103 F. He became cyanotic and had generalized convulsions. The child died at 2:50 p. m. on September 27, six hours and forty minutes after admission to the hospital and approximately twenty-six hours after the onset of the illness.

An autopsy was performed by one of us (Hertzog) forty-five minutes after death. The essential findings were limited to the brain. The subarachnoid space over the entire brain, including the cerebellum and the midbrain, was filled with a patchy yellow purulent exudate. The spinal cord was not removed. The base of the skull appeared normal. No evidence of any suppuration could be found in the sinuses or middle ears. The findings in the abdominal organs were those of cloudy swelling. Smears and cultures from the brain showed H. influenzae. Postmortem blood culture showed H. influenzae. The anatomic diagnosis was diffuse suppurative meningitis due to Haemophilus influenzae, type B.

Case 2.—L. M., a boy aged 2 years, had previously enjoyed good health. He was the only other child in the family. Like his older brother he also had a mild upper respiratory infection. Prior to his brother's illness he had been sleeping in the same bed with him. On Sept. 29, 1943, two days after the death of the older child, he vomited his evening meal. His parents noticed that he had a slight fever. He was seen by the family physician at 9 o'clock that night. His temperature was 102 F. He was very cooperative and had no complaints. There were no signs of any meningeal symptoms. The physician assured the family that influenzal meningitis was recognized as a noncontagious disease. At 5 o'clock the following morning the child showed muscular rigidity and convulsive movements. He was admitted to St. Barnabas Hospital at 8:05 a. m. on September 30. His temperature was 101.2 F. His neck was stiff and there were twitchings of the muscles of the extremities. There was cyanosis of the lips, and respirations were rapid. The leukocyte count was 8,950 with 43 per cent neutrophils, 12 per cent metamyelocytes, 7 per cent myelocytes, 29 per cent lymphocytes and 9 per cent monocytes. The smear showed toxic leukocytes with a definite shift to the left. A spinal puncture showed a turbid fluid with 2,660 cells per cubic millimeter. A differential count showed 96 per cent neutrophils. The spinal fluid sugar was 7.5 mg. per hundred cubic centimeters. A gram stain showed many pleomorphic gram negative bacilli. The organisms were typed by the Minnesota State Board of Health and found to be type B, Haemophilus influenzae. Cultures at both St. Barnabas Hospital and the Minnesota State Board of Health were positive for Haemophilus influenzae. Sulfadiazine was started by nasal tube. Also intravenous sulfadiazine and type B anti H. influenzae rabbit serum were started intravenously. His temperature rose to 106 F. Respirations became irregular and he died at 12:10 p. m., approximately four hours after admission to the hospital. His entire illness lasted approximately eighteen hours.

An autopsy was performed by one of us (Hertzog) one hour and fifty minutes after death. The findings were similar to those in the first case. The subarachnoid space over the entire brain, including the cerebellum and the midbrain, was filled with a patchy purulent exudate. The superficial vessels of the brain showed pronounced congestion. No evidence of any suppuration could be found in the sinuses or middle ears. The only findings in the thoracic and abdominal organs were cloudy swelling. Smears and cultures from the brain showed H. influenzae. A postmortem blood culture also showed H. influenzae. The anatomic diagnosis was diffuse suppurative meningitis due to Haemophilus influenzae, type B.

COMMENT

The method of spread of influenzal meningitis is not well understood. The usual sporadic nature of the disease suggests carriers as a possible source of infection. In our cases, nose and throat cultures taken by the Minnesota Department of Health from parents and other contacts were negative for H. influenzae. The tendency to affect infants and young children almost exclusively suggests that the average adult is immune to the disease. Occasionally the disease follows subcutaneous abscesses,[3] joint infections and tracheobronchitis [4] and middle ear infections [5] in which H. influenzae has been recovered prior to the onset of the meningitis. Positive antemortem blood cultures have been reported.[6] Postmortem blood cultures are usually positive. In the majority of cases the disease appears suddenly in a previously healthy infant.

From St. Barnabas Hospital and the Department of Pathology of the University of Minnesota Medical School.

1. Levinson, A.: Meningitis, in Brennemann, J.: Practice of Pediatrics, Hagerstown, Md., W. F. Prior Company, Inc., 1942, vol. 4, chapter 8, pp. 65-68.
2. Davis, D. J.: Influenzal Meningitis, Arch. Int. Med. **4**: 323-330 (Oct.) 1909.
3. Dowds, J. H.: Pfeiffer's Bacillus Meningitis: Two Unusual Cases, Lancet **2**: 100, 1940.
4. Neter, Erwin: Observations on Children with Influenzal Meningitis Who were Treated with Specific Serum, Sulfanilamide and Sulfapyridine, Arch. Path. **28**: 603-604 (Oct.) 1939.
5. Watson-Williams, E.: Influenzal Meningitis in an Adult with Recovery, Lancet **2**: 1430-1431, 1937.
6. Hamilton, T. R., and Neff, F. C.: Influenzal Meningitis with Bacteremia Treated with Sulfapyridine, J. A. M. A. **113**: 1123-1124 (Sept. 16) 1939.

The relation of the disease to respiratory infections is not clear. Pittman[7] has shown that practically all cases of influenzal meningitis are due to a smooth encapsulated strain of the organism that she calls type B. The organism usually found in the respiratory passages is a less virulent rough strain, although occasionally the type B smooth strain is isolated from the respiratory tract.

The former almost universally fatal course of the disease has been greatly reduced by the aid of the sulfonamide drugs and specific type B anti-influenza rabbit serum. In a series of 26 patients who lived more than forty hours Alexander[8] reports a mortality of 35 per cent with specific serum alone. The specific serum also offers a rapid method of positive identification of a gram negative bacillus found in the spinal fluid by means of capsular swelling similar to the Neufelt reaction in typing pneumococci. Sako, Stewart and Fleet[9] question the efficiency of the serum and report encouraging results from sulfadiazine alone.

These cases show that it is possible to have more than one child in a family contract influenzal meningitis and that the disease is potentially contagious. If other young children are present in a family where influenzal meningitis has occurred, prophylactic doses of sulfadiazine or passive immunization would seem indicated. According to Davis's[2] report of the disease in newborn twins, the incubation period is less than five days.

SUMMARY

Acute fulminating influenzal meningitis occurred in brothers. The older, aged 4 years, died within twenty-six hours after onset of the disease. The younger, aged 2 years, became ill two days later and died within fifteen hours. Autopsies showed diffuse suppurative meningitis due to type B Haemophilus influenzae.

DUODENAL ULCER CONCOMITANT IN IDENTICAL TWINS

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NEW ORLEANS

Identical or uniovular twins theoretically contain "identical determiners" in their chromosomes which constitute the chief physical basis of heredity; they are always of the same sex and of similar physical characteristics. They are therefore often of equally normal mental and physical pattern; likewise pathologic departures of close contrast, in both respects, are not unusual. Depiction of the spiritual communion manifest between twins has produced interesting reading; the Antipholus pair served by the Dromio identicals gave us Shakespeare's "Comedy of Errors." Numerous less prominent literatures and fictional authors have used the similarity to advantage.

Medical writers have interested themselves in the physiology of twinning and the study of twins in health and disease. Perusal of reference sources reveals case reports of diverse and seemingly innumerable pathologic entities common to identical twins. This survey, however, fails to produce a reported instance of a duodenal ulcer occurring in one or both of identical twins. A review of ulcer etiologic possibilities emphasizes "constitutional predisposition" and "tissue susceptibility" which might nicely have been exemplified by a report such as we are to make.

REPORT OF CASE

Ernest and Cecil, identical twins aged 28 years, resemble each other very closely in size, weight and general appearance. Through youth they developed along similar lines, accomplished equal educational achievements, married in the same year, neither reported siblings, artisans employed by the same concern, they have made essentially identical advancements. Both smoked excessively and drank moderately.

E. N. R. was hospitalized and adhered to an acceptable bed rest ulcer regimen, returning for eight weeks. An asymptomatic phase of eight months was thereby achieved, subsequent to which relaxation from his regimen resulted in recurrent symptoms, which progressed with melena on the tenth month, obstructive symptoms and intractable pain on the twelfth month. Surgery was elected, and a subtotal gastrectomy done on Dec. 13, 1941.

His is an instance of postgastrectomy asthenia with loss of weight, quantitative dyspepsia, gastrocolic reflex with intermittent diarrhea and secondary anemia despite a gastroscopically and roentgenologically mechanically perfect resection. Achlorhydria was produced. There were no recurrent ulcer symptoms in an eighteen month follow-up nor any improvement in his postgastrectomy symptoms despite diet, hydrochloric acid, liver, vitamins parenterally and other measures.

Measurements

	Twin E. N. R.	Twin C. W. R.
Height	64½ inches (163 cm.)	64 inches (162.5 cm.)
Weight	189 pounds (85.7 Kg.)	193 pounds (87.5 Kg.)
Past illnesses	Pneumonia, 1932	Influenza, 1932
Onset ulcer syndrome	June 1938	June 1939
Postcibal pain relieved by alkali	Present	Present
Night pain	2 years	3 months
Nausea	Absent	Absent
Vomiting	Absent	Absent
Quantitative dyspepsia	Present	Present
Localized supraumbilical pain	Present	Present
Gastric analysis:		
Free hydrochloric acid	41	52
Total acidity	65	76

Roentgenologic findings: E. N. R., penetrating crater inferior surface Duodenal bulb: C. W. R., penetrating crater lesser curvature just beyond cap

C. W. R. refused hospitalization and has followed, indifferently, an ambulatory ulcer regimen. He has had one mild episode of melena. On three occasions he has put himself to bed for brief periods on a modified Sippy regimen because of severe pain and persistent vomiting.

His brother's precedence has not encouraged him to accept further medical advice.

COMMENT

Each of these twins, therefore, appears to have developed identically complicated duodenal ulcers at the same period of life. This would seem confirmatory of the theory of constitutional predisposition; identical twins should be expected to be of similar tissue susceptibility. The surgical experiences of the one affecting the decisions of the other leaves one gastrointestinally uncomfortable despite acceptable management, the other with active ulcer symptoms. Speculation as to the outcome of surgery should it become compulsory to the second twin is interesting.

We have added a pathologic entity occurring in identical twins, namely duodenal ulcer.

Our findings may lend support to the hypothesis of constitutional predisposition.

1534 Aline Street.

TREATMENT OF THE LIP AND CHEEK IN CASES OF FACIAL PARALYSIS

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A new simple method of supporting the lip and cheek in cases of Bell's palsy or facial paralysis has been found to be successful in a number of instances. It is necessary to give this support to prevent the droop and loss of tone that is so characteristic of these tissues in facial paralysis.

This method consists in cradling the lip and cheek in a translucent plastic support and connecting that support by rubber band tension to a metal hook that is fastened to the last upper molar on the affected side (fig. 1).

The lip support or cradle (*A-B*) is the part that actually lifts the lip and cheek under tension from the rubber hand. It consists of two flanges and a connecting bar that is shaped to conform to the closed lips (fig. 2). The flanges should be large enough to keep the tissues from bunching at the angle of the mouth.

7. Pittman, Margaret: The S and R Forms of Haemophilus Influenzae, Proc. Soc. Exper. Biol. & Med. **27:** 299-301, 1929-1930.
8. Alexander, H. E.: Treatment of Bacterial Meningitis, Bull. New York Acad. Med. **17:** 100-115, 1941.
9. Sako, Wallace; Stewart, C. A., and Fleet, Joel: Treatment of Influenzal Meningitis with Sulfadiazine, J. A. M. A. **119:** 327-331 (May 23) 1942.

From the Department of Medicine, Tulane University School of Medicine, and the Gastroenterology Clinic of Touro Infirmary.

Dental pink base plate wax is used to model the lip support. Care should be taken to keep the flanges from spreading away from each other under tissue pressure while it is being fitted. The wax model can then be reproduced in a translucent acrylic resin which is not at all unsightly or conspicuous. It is also light in weight, not irritating to the tissues, easy to keep clean and easily processed.

The band (*C*) around the molar is constructed similarly to the bands used in orthodontia appliances or in gold crowns except that it is never necessary to cut into the tooth. If the contact between the last two teeth is so close that a band cannot be passed over the tooth, this can be remedied by encircling the contact point with a 26 gage wire and twisting the ends to make it tight. In a matter of a few days there will be a space between the teeth, and the fitting and placement of the band may proceed. Gold of 22 karat and 30 gage has been found very satisfactory for the band. To this is soldered the hook (*D*), which is contoured of half round 17 gage dental clasp wire. The positioning and soldering of the hook is done best on a model made of a heat resisting material such as is used in ordinary dental soldering technics. The hook should be placed as high in the cul-de-sac as is consistent with the activity of the surrounding tissues. It should also be adapted close to the alveolar process above and posterior to the tooth.

The band (*C*) should then be placed on the tooth in the mouth for trial, and adjustments made to the hook (*D*) so that the proper direction of pull on the lip is obtained. The direction of pull should be up and back and is governed by the amount of lip droop, the length and anatomic conformation of the lip, the amount of fat tissue present and the restriction of the surrounding tissues. The band may then be cemented in place.

Several holes for rubber band attachment are drilled in the inner flange of the lip cradle, as can be seen in the illustration. A small rubber band (*E*) is fastened to the flange by looping one end of the rubber band through a hole and then back through the other end of itself. It is generally an easy matter for the patient to stretch the free loop end of the rubber band over the end of the forefinger and pass it back over the hook while holding the lip cradle in the palm of the hand. The cradle

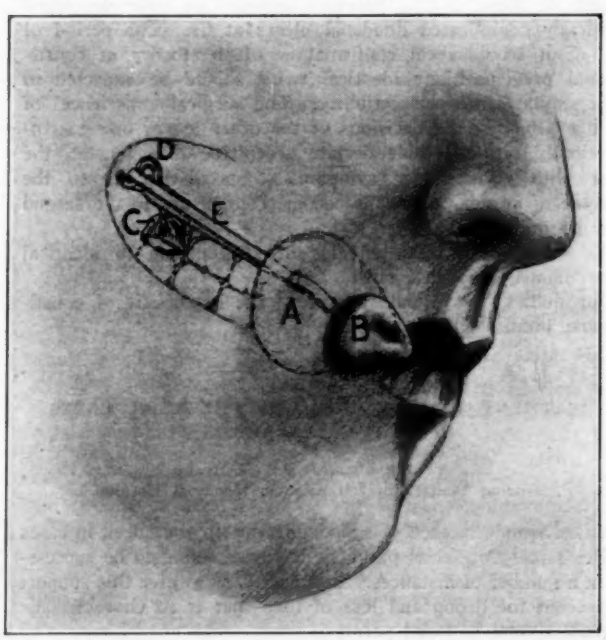

Fig. 1.—Diagrammatic view of appliances for supporting the lip and cheek. *A* is the flange of the cradle inside the cheek and *B* the outer flange. This pulls the lip under traction from the rubber band, *E*, which is attached to the hook, *D*, on the gold band, *C*.

can easily be placed in position at the angle of the mouth. Experiment will determine the tension and size of the rubber band to be used and which holes in the appliance are the most effective to use for fastening the bands.

Preparation of the tooth and the metal band to which the hook is soldered should be preceded by dental x-ray and clinical examination. If the alveolar bone about the tooth in question has receded very much, it is better to consider the possibilities of the next tooth forward. The difficulty with using a tooth too far anterior is that enough distance for adequate tension of the rubber band is not always obtained. Carious areas in the tooth should of course be filled, and calcular deposits should be removed.

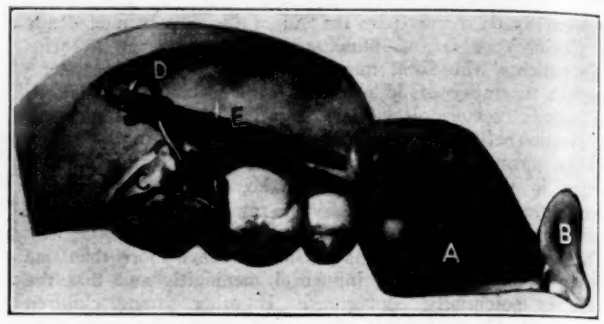

Fig. 2.—Plastic lip cradle (*A B*), rubber band (*E*), hook (*D*) and band (*C*) on a plaster cast of the maxillary teeth.

Study must also be made of the excursions of the anterior border of the ascending ramus of the mandible in lateral movements and in opening and closing the jaws. This will determine to some extent the position of the hook. In some cases the anterior border of the ramus will be found in almost direct contact with the mucosa of the alveolar process above the molars when the mandible is moved to the opposite side. In this event it may be impossible to place the hook in an advantageous position, and the technic may have to be modified or abandoned.

This method of lip and cheek support offers several advantages over other methods. It eliminates the conspicuousness which is so striking when adhesive tape or ear attachments and vulcanite are used. The translucent cradle is not very noticeable. The discomfort of traction over an ear and the messiness of adhesive tape are done away with. The device, once established, is easy to apply and use. It also gives better control of the tissues than do the other methods. Most important of all, the patient will use this appliance consistently at all times, whereas he did not do so with the others. Use of the device should be maintained until normal muscle function returns.

122 South Michigan Avenue.

SENSITIVITY TO THIOURACIL

REPORT OF THREE CASES

J. L. Gabrilove, M.D., and M. J. Kert, M.D., New York

In view of the recent reports [1] on the treatment of hyperthyroidism with thiouracil, several cases were selected for this type of therapy. Nine cases have been treated to date and three have exhibited manifestations of drug sensitivity.

Our purpose in this report is to point out the toxic effects observed in the treatment of relatively few patients. It is not our desire at this time to comment on the efficacy of the drug in the treatment of hyperthyroidism.

Case 1.—A man aged 55 complained of nervousness, sweating, weight loss, protrusion of the eyeballs, palpitation and exertional dyspnea. There was no past history of allergy. On examination there were noted moderate exophthalmos, an enlarged thyroid gland, moist palms and a tremor of the outstretched hands. The heart was overactive, with a rate of 120. The blood pressure was 150/70 mm. of mercury. The basal metabolic rate on two occasions was plus 41 per cent and plus 42 per cent. The hemogram was normal.

After a test dose of 0.2 Gm. of thiouracil he received 0.6 Gm. the first day and 1 Gm. daily thereafter. After ten days of

The thiouracil used was furnished by Lederle Laboratories, Inc.

From the Medical Services of Dr. George Baehr and Dr. Eli Moschcowitz, the Mount Sinai Hospital.

1. Astwood, E. B.: Treatment of Hyperthyroidism with Thiourea and Thiouracil, J. A. M. A. **122**: 78 (May 8) 1943. Williams, R. H., and Bissell, G. W.: Thiouracil in the Treatment of Thyrotoxicosis, New England J. Med. **229**: 97 (July 15) 1943.

treatment he complained of chilliness and malaise, and his temperature rose to 102.4 F. A moderate generalized lymphadenopathy was noted, and infectious mononucleosis was suspected. This was excluded by the finding of a normal hemogram and a negative blood heterophile reaction. The day after the febrile rise a diffuse erythematous maculopapular eruption was noted. Thiouracil toxicity was suspected and the drug was discontinued, although phenobarbital, which he had been receiving, was continued. Twenty-four hours after the cessation of the administration of thiouracil the temperature returned to normal, and in a few days the rash began to fade. Iodine was subsequently administered, and the patient underwent an uneventful subtotal thyroidectomy.

CASE 2.—A white woman aged 30, with a past history of Darier's disease and a cholecystectomy, had had a subtotal thyroidectomy for toxic diffuse goiter one year before. The pathologic report was "hyperplastic thyroid as seen in Graves' disease in a colloid phase." Her basal metabolic rate fell from plus 71 per cent preoperatively to minus 8 per cent postoperatively. She entered for the fourth time because of weight loss, nervousness, palpitation and easy fatigability. There was no past history of allergy.

On examination she was very obese, perspiring and flushed. There was no exophthalmos, lidlag or stare. There was an indurated thyroidectomy scar. Her heart rate ranged between 80 and 100. The blood pressure was 160/106 mm. of mercury. The basal metabolic rate was plus 38 per cent and plus 47 per cent. The blood sugar was 165 mg. per hundred cubic centimeters. In view of the evidences of recurrence of toxic diffuse goiter, the patient was given thiouracil 1 Gm. daily, administered in five divided doses. At the end of the eighth day of treatment her temperature rose to 100.6 F. The next day the temperature was 105 F. No chill was experienced. There were no physical findings to account for the fever. The administration of the drug was therefore stopped, and the temperature fell slowly over a period of two days. The day after her temperature had risen to 105 F. a purplish red maculopapular eruption appeared on the arms. The rash cleared in two days. One week after the cessation of the administration of thiouracil, and after her temperature had become normal and the rash had cleared, she was given 0.2 Gm. of thiouracil. She had a chill, a rise in temperature to 105.4 F. and a reappearance of the skin eruption on the arms. Her temperature fell to normal in one and a half days, and the rash disappeared in three days. Patch and scratch tests with thiouracil were negative. She received barbiturates throughout her stay in the hospital without adverse effects. Since thiourea was not available, the patient was given strong solution of iodine (Lugol's solution) in preparation for a secondary thyroid operation.

CASE 3.—A woman aged 47 complained of nervousness, tremor, intolerance to heat and a weight loss of 27 pounds (12 Kg.). She had been given strong solution of iodine intermittently during the past four months. The patient was nervous, apprehensive and overactive. The thyroid gland was slightly enlarged. There was no exophthalmos, lidlag or stare. The blood pressure was 160/80 mm. of mercury. The pulse ranged between 90 and 110. The basal metabolic rate was plus 34 per cent on two occasions. The circulation time was 8 seconds (arm to tongue). The white blood cell count was 6,250 with 57 per cent segmented polymorphonuclear leukocytes, 4 per cent nonsegmented polymorphonuclear leukocytes, 34 per cent lymphocytes and 5 per cent monocytes. The patient was given 1 Gm. of thiouracil a day in five divided doses. Her basal metabolic rate fell to plus 23 per cent and the pulse slowed to between 80 and 90 per minute, but her weight remained stationary. After sixteen days of therapy the white blood cell count fell to 2,650 with a differential of 59 per cent segmented polymorphonuclear leukocytes, 4 per cent nonsegmented polymorphonuclear leukocytes, 28 per cent lymphocytes, 4 per cent monocytes and 5 per cent eosinophils. It was deemed advisable to stop the administration of the drug. She was then prepared for subtotal thyroidectomy by strong solution of iodine, which she underwent uneventfully. The pathologic report was "hyperplastic thyroid gland as seen in Graves' disease in a colloid phase."

CONCLUSION

Nine patients with hyperthyroidism were treated with thiouracil, and 3 developed untoward effects from the drug. One developed fever, generalized lymphadenopathy and dermatitis. Another exhibited fever and dermatitis. In the third a moderate leukopenia occurred.

Fifth Avenue and One Hundredth Street.

Special Article

AMERICAN HEALTH RESORTS

UNDERWATER THERAPY AT SPAS

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These special articles on spa therapy and American health resorts were prepared under the direction of the Committee on American Health Resorts. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the committee. These articles may be published later as a Handbook on Health Resorts.

Present day underwater therapy embodies three of the basic principles of physical medicine: (1) hydrotherapy, (2) therapeutic exercise based on a thorough knowledge of muscle anatomy and action and (3) massage. Regardless of the type of water or apparatus used and of the disease to be treated, these principles hold and their application is based on definite physiologic responses of the body to their use.[1] By giving therapeutic exercise and massage in water, certain mechanical advantages are obtained which increase the range of physiologic effect and permit a more accurate and satisfactory exercise dosage to be given.[2] There is nothing "specific" in this form of therapy. Results obtained from using it are directly proportional to the diagnostic acumen of the physician and the skill and training of the physical therapist giving the treatment.

The use of water, exercise and massage in the treatment of disease is as old as man, and the evolutionary development of these agents, their discovery and rediscovery, form one of the interesting chapters in medical history. In the earlier English literature the terms hydrotherapy and balneotherapy are used synonymously to describe treatment with water. In 1905 Hermann and Parkes Weber differentiated between these two terms, using hydrotherapy to designate outward application of water to the body and balneotherapy to indi-

1. Krusen, F. H.: Physical Therapy in Arthritis, New York, Paul B. Hoeber, Inc., 1937; Physical Medicine, Philadelphia, W. B. Saunders Company, 1941. Lowman, C. L.: Physical Equipment of Therapeutic Pools, J. A. M. A. **94**: 845-849 (March 22) 1930; Postoperative Use of Therapeutic Pools, Northwest Med. **30**: 538-541 (Dec.) 1931; Underwater Gymnastics, J. A. M. A. **97**: 1074-1076 (Oct. 10) 1931. Currence.[5] Lowman.[6]

2. Smith, E. M.: Underwater Therapy in Chronic Arthritis, Arch. Phys. Therapy **16**: 534-536 (Sept.) 1935; Underwater Therapy in the Treatment of Chronic Arthritis, J. Arkansas M. Soc. **32**: 137-138 (Feb.) 1936; Physical Therapy in Chronic Atrophic Arthritis, Arch. Phys. Therapy **18**: 622-626 (Oct.) 1937. Crook, B. L.: Outwitting Arthritis, Hygeia **16**: 106-108 (Feb.) 1938; Recent Research in the Treatment of Early Poliomyelitis, read at the joint meeting of the American Health, Recreation and Physical Education Association with American Physiotherapy Association, New Orleans, April 1942; footnote 31.

cate bathing at a resort or spa.[3] Later this term was applied to anything pertaining to spa therapy. The use of massage under water was practiced by the early Greeks and Romans and was carried from Rome to Egypt and then back to France and Aix-les-Bains by Napoleon's soldiers at the end of the eighteenth century.[3] Peter Henry Ling (1776-1839) and Hjalman Frederick Ling (1820-1886) developed a system of medical gymnastics in Sweden that was based on the physiology of the times. In the early part of the present century two American physicians, Lovett[4] and Lowman,[5] laid the ground work for our present day concept of therapeutic exercise.

INFLUENCE OF GRAVITY ON MUSCLE ACTION

Lovett, while working with infantile paralysis during the epidemic of 1914 in Vermont, made the contribution of specific muscle training or muscle reeducation and was the first to call attention to the influence of gravity on muscle action. By this work he established standard tests by which muscle power can be graded and appropriate exercises administered. He classified therapeutic exercises as those performed with the aid of gravity, those performed with gravity neutralized and those performed against the force of gravity. He stressed the importance in muscle training or reeducation of a thorough knowledge of muscle anatomy and muscle action. His concepts were forwarded by Legg and Merrill[6] and others and, as a consequence, a systematic method of reeducation of weakened and atrophied muscles by exercise was developed.

Between 1910 and 1920 Lowman, working with spastic paralysis and later on infantile paralysis, began the development of an entirely new concept of therapeutic exercise wherein the exercise was given while the body was immersed in water. He too emphasized a thorough knowledge of muscle anatomy and action but in addition he applied the laws of hydraulics to a body immersed in water and showed that the buoyancy of the water, acting in opposition to gravity, enabled the patient to move freely in all planes. Lowman's concept also took into account not only the buoyancy of the water but the hydrostatic pressure, viscosity and the pressure of water as related to velocity of motion in water. By immersing a patient in water, Lowman was able to demonstrate that fixation of a muscle or muscle groups may be obtained by the operator or by the active stabilization of the patient's own muscles and, by gradation of difficulties of movement in water, he worked out seven variations of exercises. In each gradation it is presumed that the origin of the muscle is held firm by the operator or by means of muscular fixation. These seven variations are classified as follows: (1) active passive movement, (2) contraction against viscosity, (3) movement aided by buoyancy but against the pull of gravity and the weight of superincumbent water, (4) resistive action, (5) contraction of the muscle from both origin and insertion, (6) contraction against gravity and (7) stabilization of base of action.[5]

TEMPERATURE OF WATER

The effects of a variance of heat and the exact temperature which might be optimum for handling disabilities came then to the attention of the investigators.[7] The first therapeutic pools were considered chiefly to be of importance as a medium for promoting bodily movement. Interest developed slowly in possible physiologic effects to be derived from changing the temperature of the water.[8] The general opinion seemed to be that the temperature of the therapeutic pools should be kept constant at 93 to 95 F. in order to be completely neutral in effect on muscles paralyzed by anterior poliomyelitis. As muscle reeducation under water gained in popularity, investigators began a study of the effect of a higher temperature, especially in the treatment of spastic muscles. It became generally accepted that a temperature of around 98 to 100 F. was optimum for the relaxation of spastic muscles. Thus we find that most institutions had more than one pool. In the warm pool poliomyelitis was treated, and in a very warm pool spastics were treated.

A keyhole shaped tub was designed by C. P. Hubbard in order that underwater exercises might be given in a relatively small space, and, more important, that the temperature of the water might be changed as rapidly as necessary to treat differing conditions.

Later John Currence improved on this design by adding a thermostatic control and an underwater douche or whirlpool and by modifying the shape and construction of the Hubbard tub. This finally perfected tub was called the Hubbard-Currence tub. In this tub it is possible to start the treatment of each patient with the water at a given temperature and gradually increase the temperature by several degrees and then lower the temperature for the remainder of the treatment.[8]

In 1927 the Georgia Warm Springs Foundation was organized through the influence of Franklin D. Roosevelt as a medical institution for the study and treatment of the after-effects of infantile paralysis.[9] These natural spring waters at a temperature of 89 F. provided an excellent medium for underwater exercise, and this form of therapy thus has gained considerable publicity and popularity.

The further study and development of underwater therapy has been advocated by a number of recent writers and authorities on physical medicine. Nylin,[10] Sherwood,[11] Frazier,[12] Walker,[13] Olsen[14] and others in writing on arthritis recommend the warm pool for relief of muscle pain and spasm and comment on the importance of the elimination of body weight due to the buoyancy of the water. Lowman[5] states that, "in painful conditions involving the joint, release of joint friction due to the absence of weight of part, or lessening of the gravity load, makes joint action possible with lessened or no pain, through a much larger arc of move-

3. Rolleston, H.: The History of Physical Medicine, Brit. J. Phys. Med. **12**: 140-144 (Nov.) 1937.

4. Lovett, R. W.: The Treatment of Infantile Paralysis, Philadelphia, P. Blakiston's Son & Co., 1917.

5. Lowman, C. L.: Technique of Underwater Gymnastics, Los Angeles, American Publications, Inc., 1937.

6. Legg, A., and Merrill, J.: Physical Therapy in Infantile Paralysis, in Mock, H. E.; Pemberton, Ralph, and Coulter, J. S.: Principles and Practice of Physical Therapy, Hagerstown, Md., W. F. Prior Company, Inc., 1932, vol. 2, chapter 8.

7. Coulter, J. S.: Underwater Treatment: Hydrogymnastics, in Piersol, G. M.: Cyclopedia of Medicine, Philadelphia, F. A. Davis Company, 1939, pp. 637-643. Kovács, R.: Yearbook of Physical Therapy, Chicago, Year Book Publishers, Inc., 1942. Krusen.[1] Lowman.[5] Elson and Hawkins.[10]

8. Currence, J. D.: Improved Underwater Therapy, Mod. Hosp. **50**: 86-88 (April) 1938; An Improved Method of Underwater Treatment of Arthritis, Arch. Phys. Therapy **29**: 84-87 (Feb.) 1938; Underwater Therapy in Arthritis, ibid. **16**: 291-294 (May) 1935.

9. Hubbard, L. W.: Hydrogymnastics, Internat. Clin. **3**: 212-215 (Sept.) 1933.

10. Nylin, J. B.: Hydrotherapy: General Principles, Arch. M. Hydrol. **11**: 157 (May) 1933; Underwater Exercises, ibid. **16**: 44 (April) 1938.

11. Sherwood, K. K.: Physical Therapy in Arthritis, Physiotherapy Rev. **20**: 134-137 (May-June) 1940.

12. Frazier, V. E.: Underwater Therapy in Chronic Arthritis, J. Missouri M. A. **37**: 192-193 (May) 1940.

13. Walker, P. J.: The Orthopedic Management of Arthritis, Physiotherapy Rev. **19**: 337-339 (Nov.-Dec.) 1939.

14. Olsen, A. B.: Indications for Hydrokinesitherapy, Arch. Phys. Therapy, **16**: 295-298 (May) 1935.

ment than is otherwise made. In congested and painful joints full of inflammatory débris, and even in septic cases, this increase in the arc of painless movement aids materially in hastening the elimination of exudates, prevents adhesions and reduces the amount of atrophy of the muscle actuating that particular joint. Clinically there is evidence of improved circulation from standing and walking in deep water."

Allman,[15] Hansson,[16] Hubbard[9] and others believe that the therapeutic pool when properly installed and equipped is the most nearly perfect of hydrotherapy measures if staffed by a competent physical therapist under the guidance of a physician. Hansson,[16] Atsatt,[17] Lowman[5] and many others emphasize the beneficial psychologic effects obtained in therapeutic pool treatments. Brockway[18] writes of the effectiveness of saline pools. Currence[8] and Elson and Hawkins[19] discuss the advantages of the Hubbard or Hubbard-Currence tub technic.

Although Lowman used heated water in some of his work, his primary interest was in the science of movement in water, and in his earlier writings he had little to say about the use of water as a therapeutic agent or of the use of massage under water.

INTEREST IN EUROPE

Soon after the first world war considerable interest was developed in European health resorts, particularly in the ones having mineral or thermal waters as a natural resource. The European literature of this period is voluminous.[20] Great stress is placed on the specific properties of the various waters and their physiologic effects. Therapeutic exercise played a minor role. Provisions were made at the better bathing establishments for walking in the pools, but the scientific application of the basic principles laid down by Lowman were disregarded. Strasser[21] wrote at length on the scientific foundations of hydrotherapy without mentioning the subject of therapeutic exercises. In writing on the use of thermal waters of Bath, England, Gordon[22] describes the pool and briefly explains how patients are placed in the pool, where passive movements of the legs are carried out and he is encouraged to kick out in any direction he can."

It was during the first world war that the undercurrent douche came to be used in the treatment of war injuries. This was similar to the individual exercise tub used in America except that the emphasis was placed on the importance of the thermal whirlpool effect of the undercurrent douche rather than on any exercise program.[23]

During the decades from 1920 to 1940 several European writers evidenced interest in underwater therapy in pools. Much was written on the temperature of the water. At Bath, England, spastic paralysis was treated in pools maintaining an average temperature of 102 to 104 F.[24] In London, Ray[25] mentions the use of three temperatures for the pool bath in the treatment of arthritis. These he gave as 100, 102 and 104 F. Patients were urged to walk about in the water and manipulate an underwater douche themselves, directing the stream of hot water against painful joints. This combination of whirlpool with large therapeutic pool is unique. Kersley[26] advocates the use of water combined with plaster immobilization in the treatment of rheumatoid arthritis and recommends a hot pool of 102 F. He merely suggests that the manipulator, who is in the water with the patient, may put the limbs through the desired range of motion and allow him to perform assisted or resisted exercises or walk along parallel bars. Freund[27] states that in typical hemiplegia an early beginning should be made with passive movements, massage to the muscles and the practice of movements in a deep bath at indifferent temperature.

From 1940 to the present time, interest in Europe has been centered on the treatment of war injuries. Holmes[28] states that, with the obvious increase of war injuries, special consideration should be given disabilities which may be helped by hydrotherapy. Acknowledging that patients in spa hospitals receive the benefit of orthopedic advice and treatment, he says he knows of no orthopedic institution in Great Britain which has a hydrotherapy department. He remarks "Experience in the treatment of rheumatic diseases of both private and hospital spa practice has convinced me that hydrotherapy is the most useful form of physical treatment in these conditions, wherein moist heat is generally more efficacious than dry heat." Ray[29] quotes Lowman in reference to the use of the therapeutic pool and urges the use of the therapeutic pool,[30] saying that "for some unexplained cause the therapeutic pool, apart from the spas, has never attained the popularity in this country that it has in America. A few institutions have installed them, and the sole object of this paper is to urge the importance of a rapid increase in their number."

THERAPEUTIC POOL VERSUS CASTS

In 1939 Hipps and Crook, working with thermal saline waters, were of the opinion that a therapeutic pool is an essential part of the physical therapy department. In the treatment of acute poliomyelitis cases they found that the hot pool is most effective. At that time most institutions were keeping patients in casts for weeks or months following infantile paralysis. There was a vogue for extreme length of casting. They used an opposite technic, one of no casting and extremely early pool therapy. Poliomyelitis patients were placed in the hot salt pool as soon as the fever subsided. They found that the acute muscle soreness, probably associated with spasm, left within a few days, that contrac-

15. Allman, D. B.: Hydrotherapy and Its Use at the Betty Bacharach Home, J. M. Soc. New Jersey **35**: 735-737 (Dec.) 1938.
16. Hansson, K. G.: Hydrogymnastics in Infantile Paralysis, Arch. Phys. Therapy **12**: 539 (Sept.) 1931; After Treatment of Poliomyelitis, J. A. M. A. **113**: 32-35 (July 1) 1939.
17. Atsatt, R. F., and Ussher, N. T.: Atrophic Arthritis: A Logical Regime for Treatment, Physiotherapy Rev. **18**: 235-239 (Sept.-Oct.) 1938.
18. Brockway, A.: Osteomyelitis and Suppurative Joints: Salt Water Pool Treatment, California & West. Med. **46**: 174 (March) 1937; abstr. J. A. M. A. **108**: 1573 (May 1) 1937.
19. Elson, J. C., and Hawkins, F. M.: Hydrotherapy Treatment in a General Hospital, Brit. J. Phys. Med. **7**: 96-98 (Sept.) 1932.
20. Delacroix, A.: The Treatment of Arthritis with Mineral Radioactive Waters, Arch. M. Hydrol. **10**: 82-83 (Aug.) 1932. Fox, J. T.: Notes on the Sedative Pool, ibid. **7**, August 1929. Gollwitzer-Meier, K.: Kreislauf und Atmung im Bad, Balneologie **2**: 289-299 (July) 1935; abstracted, Arch. M. Hydrol. **14**: 214 (Oct.) 1936. Valette, Clogne and Drilhon: The Skin: Reaction to Baths, abstracted, ibid. **12**: 279 (Oct.) 1934. Strasser.[21] Gordon.[22]
21. Strasser, A.: The Scientific Foundations of Hydrotherapeutics, Arch. M. Hydrol. **1**: 16-21 (May) 1922.
22. Gordon, R. G.: The Use of Thermal Waters in Paralysis, Arch. M. Hydrol. **5**: 162 (May) 1924.
23. Hebblethwaite, S. M.: The Use of Manipulation Baths for the Relief of Pain in the Course and Distribution of Nerves, Arch. M. Hydrol. **3**: 6-8 (Jan.) 1925. Holmes, G.; Thomson, F. G., and Shipton, W.: The Undercurrent Douche in England, ibid. **13**: 29 (April) 1935. Smith and Lutterloh.[24]
24. Gordon, R. G.: The Use of Thermal Waters in Paralysis, Arch. M. Hydrol. **3**: 95 (June) 1923.
25. Ray, M. B.: The Treatment of Chronic Rheumatic Disorders: Hydrological Methods at the British Red Cross Clinic for Rheumatism, Arch. M. Hydrol. **11**: 109-112 (Jan.) 1933.
26. Kersley, G. D.: Hydrology Coupled with Plaster Immobilization in the Treatment of Rheumatic Arthritis, Arch. M. Hydrol. **15**: 48-49 (April) 1937.
27. Freund, E.: Physical Therapy in Paralysis and Neuroses, Arch. M. Hydrol. **15**: 285 (July) 1937.
28. Holmes, G.: Hydrotherapy as a Means of Rehabilitation, Brit. J. Phys. Med. **5**: 93-95 (May-June) 1942.
29. Ray, M. B.: The Therapeutic Pool, Lancet **1**: 683-685 (April) 1940.
30. Ray, M. B.: Hydrotherapy in the Rehabilitation of Nerve Lesions, Brit. J. Phys. Med. **15**: 11-16 (Jan.) 1942.

tures were avoided and that the patients were ready for exercise and massage under water much sooner. They also stated that these patients regained muscle power much more rapidly than patients who did not have these treatments.[31]

Studies were made by these workers under a grant from the National Foundation for Infantile Paralysis comparing the results obtained in treating patients with early pool therapy as contrasted with patients having had casts and with patients having had no treatment.[32] The group receiving early pool therapy showed 68 per cent improvement as compared to only 33 per cent improvement in patients treated with casting and late physical therapy, and of 31 per cent improvement in patients having had no physical therapy. The chief conclusion was that those who received careful early pool therapy showed much better recovery than those treated otherwise. Subsequent pathologic studies on old paralyzed muscles gave evidence of the accuracy of these conclusions.[33]

CONTINUOUS HYPEREMIA

While working with radioactive thermal waters in a therapeutic pool at a temperature of 98.6 F. over a period of years beginning about 1933 at Hot Springs, Ark., we found that the maintenance of the constant temperature of the pool resulted in an increase in the range of physiologic response in a manner most gratifying.[34] We found that, if the exercises are administered during the time the body is immersed in water at a temperature of 98.6 F., a continuous hyperemia is maintained during the entire time the muscles are actively moving. This hyperemia, assisted by the buoyancy of the water, produces general relaxation of the central nervous system. Muscle pain and muscle spasm are reduced if not entirely eliminated temporarily. The arc of motion in affected joints may be increased painlessly. This temperature is sufficient to produce definite peripheral dilatation, which increases the flow of the blood and lymph to the parts, stimulates the nutrition of muscular tissue and promotes the elimination of toxic waste materials. This elevation of temperature seems to increase the tolerance of muscles to exercise and at the same time proportionately to decrease the cumulative products of fatigue by their rapid removal. The continuous capillary dilatation during the actual time of muscle movement greatly facilitates the breaking down and excretion of organized inflammatory exudates in and around the muscles and joints. This method of applying heat during the entire time of exercise we believe to be obviously superior to that of superficial heating or "baking" followed by an exercise program which is necessarily given as the affected part rapidly loses heat. The hyperemia produced by the dry heat is not constant; there is a consequent capillary contraction and retention of toxic waste material. This reduces the exercise dosage because of the development of fatigue. Other physiologic responses we noted were that the pulse rate and respiratory rates are slightly increased and there is a lowering of blood pressure and a rise of body temperature from 1 to 2 degrees above normal, although the temperature of the water is neutral. These changes persist as long as four hours after treatment, and after the treatment the patient is relaxed and has a desire for sleep.

UNDERWATER MASSAGE

We found that underwater massage greatly enhances the value of the underwater treatment. If massage is given during the time the body is immersed in warm water, the continuous peripheral capillary dilatation and generalized interchange of blood from the deeper congested areas to the surface of the body render the massage much more effective in speeding the removal of waste products.

Underwater massage generally precedes the exercise period. With the body floating in water there is no appreciable strain on weakened muscle or inflamed joints. There is no weight to be lifted either by the patient or by the operator, and therefore the patient is more at ease and more receptive. The operator has both hands free for massage movements. The massage movements follow the muscle groups and should be both gentle and rhythmic. Light effleurage (stroking) is started as soon as a hyperemia is attained. This is given to the muscle groups above and below the affected joints, when joints are involved. Massage given about the joint structures depends on the acuteness of the joint symptoms. Only effleurage and petrissage (kneading) are used generally, with some gentle friction given around the joints in some cases. If tendons are contracted, these can be stretched gradually with gentle traction and reverse stroking, slowly becoming more forceful as relaxation is achieved. All sudden strong movements are contraindicated, however, and heavy massage is definitely detrimental. Careful and intelligent work in massage is most essential.

UNDERWATER EXERCISE

The type of underwater exercise given and the dosage depend on the condition of the individual patient, the type of disease, the duration of the disease, the acuteness of the disease, the age of the patient and many other factors. We believe that passive movement is useful in teaching the patient the possible range of his muscle action but that muscle training to be effective must be active. More than that, it requires concentrated mental effort on the part of the patient after he has been taught the origin, insertion and action of the muscles involved. Complete cooperation and understanding must exist between the patient and the physical therapist. We found that patients who eagerly learned how to perform isolated and group muscle actions in a well coordinated manner were soon able to progress from the assistive active exercises to active, or free, and finally resistive exercises. Those patients who were not fully cooperative did not progress so rapidly. We found it invariably true that children coordinate and localize muscle actions much more quickly and accurately than adults. One of the most important physiologic effects of performing exercises under water is that pain and muscle spasm are reduced. As a result the patient can tolerate more motion in painful joints, and the arc of movement can gradually be increased without discomfort. Exercises should be

31. Crook, B. L.: The Use of Aquatics in the Rehabilitation of Crippled Children, in Collins, E. K.: Swimming Pool Data and Reference Annual, New York, Hoffman-Harris, Inc., 1939.
32. Hipps, H. E.: Muscle Behavior Following Infantile Paralysis, Am. J. Surg. **53**: 314-318 (Aug.) 1941.
33. Hipps, H. E.: Muscle Pathology in Anterior Poliomyelitis, South. M. J. **34**: 135-146 (Feb.) 1941; The Clinical Significance of Certain Microscopic Changes in Muscles of Anterior Poliomyelitis, J. Bone & Joint Surg. **1**: 68-80 (Jan.) 1942.
34. Smith, E. M.: Underwater Therapy Applied to Chronic Atrophic Arthritis, Tr. Am. Therap. Soc. (1937) **37**: 67-68, 1938; Health Resort Therapy in the United States, read at the meeting of the American Therapeutic Society, Cleveland, Ohio, 1941. Smith, E. M., and Lutterloh, C. H.: Spa Therapy in Rheumatic Diseases, Arch. Phys. Therapy **21**: 141-143 (March) 1940. Fletcher, G. B.: Underwater or Pool Treatment of Certain Conditions of Muscles and Joints, Tri-State M. J. **12**: 2411-1213 (Jan.) 1940. Martin, L. G.: Underwater Physiotherapy and Pool Therapy, J. Arkansas M. Soc. **30**: 229-230 (April) 1934. Wootton, W. T.: The Spa Treatment of Arthritis, South. M. J. **30**: 898-901 (Sept.) 1937. Smith.[2]

performed slowly, rhythmically and through as great an arc of motion as is possible short of pain. As the result of the buoyancy of the water, the body weight is removed from the joints. This relieves strain on weakened muscles and, more important, eliminates trauma on interarticular surfaces. We found that patients who walked only with extreme joint pain outside the water could walk easily and comfortably in water of shoulder depth. Relatively free movement can be obtained in all planes. Shortened muscles can be lengthened gradually with stretching manipulations. In general the exercise program is directed toward the prevention or correction of deformities, the reeducation of atrophied muscles and the restoration of normal body mechanics. An important part of posture training is the teaching of activities used in everyday life, such as going up steps, getting up and down in a chair, sitting and walking.

The longer deformities are allowed to persist, the more difficult they are to correct.

Best results are obtained when patients are given early and adequate hydrotherapy treatment.

We believe that properly staffed hydrotherapy departments adequately equipped with therapeutic pools, Hubbard-Currence tubs and whirlpools should be standard in every health resort in the United States which uses natural thermal waters in the treatment of disease.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL ON PHARMACY AND CHEMISTRY HAS AUTHORIZED EXCLUSIVE USE OF THE METRIC SYSTEM IN ALL PUBLICATIONS FOR WHICH IT ASSUMES RESPONSIBILITY. A STATEMENT ON THIS ACTION WAS PUBLISHED IN THE JOURNAL, DEC. 4, 1943, P. 900. FOR THE BENEFIT OF THOSE WHO MAY WISH CONVERSION TABLES, THE FOLLOWING DATA ARE PRESENTED. THESE WILL BE REPRODUCED IN THE FRONT OF THE COUNCIL'S PUBLICATIONS. A LIMITED NUMBER OF REPRINTS WILL BE AVAILABLE AT THE COUNCIL'S OFFICE.

AUSTIN E. SMITH, M.D., Secretary.

TABLES OF APPROXIMATE EQUIVALENTS OF DOSES, APOTHECARIES' AND METRIC SYSTEMS

Weights

Apothecary or Troy	Metric
1 ounce	= 30 grams (Gm.)
4 drams	= 15 grams (Gm.)
2½ drams	= 10 grams (Gm.)
2 drams	= 8 grams (Gm.)
75 grains	= 5 grams (Gm.)
1 dram	= 4 grams (Gm.)
45 grains	= 3 grams (Gm.)
30 grains	= 2 grams (Gm.)
15 grains	= 1 gram (Gm.)
10 grains	= 0.65 gram (Gm.)
7½ grains	= 0.5 gram (Gm.)
7 grains	= 0.45 gram (Gm.)
6 grains	= 0.4 gram (Gm.)
5 grains	= 0.32 gram (Gm.)
4 grains	= 0.25 gram (Gm.)
3 grains	= 0.2 gram (Gm.)
2½ grains	= 0.16 gram (Gm.)
2 grains	= 0.13 gram (Gm.)
1½ grains	= 0.1 gram (Gm.)
1 grain	= 65 milligrams (mg.)
¾ grain	= 50 milligrams (mg.)
⅔ grain	= 45 milligrams (mg.)
½ grain	= 32 milligrams (mg.)
⅜ grain	= 24 milligrams (mg.)
⅓ grain	= 22 milligrams (mg.)
¼ grain	= 16 milligrams (mg.)
⅙ grain	= 11 milligrams (mg.)
⅛ grain	= 8 milligrams (mg.)
1/10 grain	= 6.5 milligrams (mg.)
1/12 grain	= 5.4 milligrams (mg.)
1/16 grain	= 4 milligrams (mg.)
1/20 grain	= 3.2 milligrams (mg.)
1/32 grain	= 2 milligrams (mg.)
1/64 grain	= 1 milligram (mg.)
1/100 grain	= 0.65 milligram (mg.)
1/120 grain	= 0.54 milligram (mg.)
1/160 grain	= 0.4 milligram (mg.)
1/210 grain	= 0.3 milligram (mg.)
1/250 grain	= 0.26 milligram (mg.)
1/320 grain	= 0.2 milligram (mg.)
1/640 grain	= 0.1 milligram (mg.)

Liquid Measures

Apothecary	Metric
1 pint	= 480 cubic centimeters (cc.)
12 fluid ounces	= 360 cubic centimeters (cc.)
8 fluid ounces	= 240 cubic centimeters (cc.)
6¾ fluid ounces	= 200 cubic centimeters (cc.)
4 fluid ounces	= 120 cubic centimeters (cc.)
3⅓ fluid ounces	= 100 cubic centimeters (cc.)
2 fluid ounces	= 60 cubic centimeters (cc.)
1⅔ fluid ounces	= 50 cubic centimeters (cc.)
1 fluid ounce	= 30 cubic centimeters (cc.)
⅚ fluid ounce	= 25 cubic centimeters (cc.)
5½ fluid drams	= 20 cubic centimeters (cc.)
4 fluid drams	= 15 cubic centimeters (cc.)
2⅔ fluid drams	= 10 cubic centimeters (cc.)
2 fluid drams	= 7½ cubic centimeters (cc.)
80 minims	= 5 cubic centimeters (cc.)
65 minims	= 4 cubic centimeters (cc.)
1 fluid dram	= 3.7 cubic centimeters (cc.)
50 minims	= 3 cubic centimeters (cc.)
45 minims	= 2.8 cubic centimeters (cc.)
32 minims	= 2 cubic centimeters (cc.)
30 minims	= 1.8 cubic centimeters (cc.)
20 minims	= 1.2 cubic centimeters (cc.)
16 minims	= 1 cubic centimeter (cc.)
15 minims	= 0.9 cubic centimeter (cc.)
12 minims	= 0.75 cubic centimeter (cc.)
10 minims	= 0.6 cubic centimeter (cc.)
8 minims	= 0.5 cubic centimeter (cc.)
5 minims	= 0.3 cubic centimeter (cc.)
3 minims	= 0.18 cubic centimeter (cc.)
1⅝ minims	= 0.1 cubic centimeter (cc.)
1 minim	= 0.06 cubic centimeter (cc.)

The Council on Pharmacy and Chemistry has voted to use exclusively the metric system in any publication for which it has sole responsibility. For this reason a table of equivalents will be provided in each book for those who are familiar only with the apothecary system.

Formerly almost every country had its own system of weights and measures, a practice which resulted in much confusion. The one system which is used almost universally and exclusively in the exact sciences is the metric system, which is based on the decimal system and has for its unit the meter and the gram. Other systems still enjoying some popularity, albeit decreasing popularity, are the Apothecaries' or Troy weight, which is used in prescriptions, the Avoirdupois or Imperial Weight, which is used in commerce, and the United States Apothecaries' or Wine Measure, which is not to be confused with the British Imperial System. Examples of the denominations of each system are: Apothecaries—grain, scruple (20 grains), drachm (or dram, 60 grains) Troy ounce (480 grains or 8 drachms); Avoirdupois—grain, ounce (437½ grains), pound (16 ounces or 7,000 grains) and the ton (2,000 pounds); Wine Measure—minim, fluidrachm (60 minims), Fluidounce (8 fluidrachms or 480 minims), pint (16 fluidounces), quart (32 fluidounces). For fairly accurate conversion:

1 Gm. = 15.43 grains
1 Gm. = 0.2572 dram
1 Gm. = 0.03215 Troy ounce
1 Gm. = 0.03527 Avoirdupois ounce
1 Gm. = 0.0022 Avoirdupois pound

1 grain = 0.648 gram (Gm.)
1 grain = 64.8 milligrams (mg.)
1 dram = 3.888 grams (Gm.)
1 Troy or Apothecary ounce = 31.1 grams (Gm.)
1 Avoirdupois ounce = 28.35 grams (Gm.)
1 Avoirdupois pound = 453.6 grams (Gm.)

1 cubic centimeter = 16.23 minims
1 milliliter = 16.23 minims
1 milliliter = 0.2705 fluid dram
1 milliliter = 0.0338 fluid ounce
1 milliliter = 0.00211 pint
1 milliliter = 0.000264 gallon

1 minim = 0.06161 cubic centimeters (cc.)
1 fluid dram = 3.6966 cubic centimeters (cc.)
1 fluid ounce = 29.57 cubic centimeters (cc.)
1 pint = 473 cubic centimeters (cc.)

This degree of exactness, however, is not usually necessary in figuring dosages, and round figures are used in the accompanying tables of approximate equivalents, which will be found more convenient for translating dosages from one system to the other. However, further approximation by the use of household units may cause greater errors; every one should remember that a minim does not necessarily equal one drop; a drop will vary with the viscosity and surface tension of the fluid and the nature of the dropping container. A teaspoon will hold from 4 cc. (1 fluid dram) to 7 cc., a dessert spoon from 9 to 14 cc., a tablespoon from 15 to 22 cc., a wine glass from 50 to 90 cc., a teacup from 125 to 240 cc. and a tumbler from 200 to 300 cc.

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SATURDAY, FEBRUARY 19, 1944

TYPHUS IN SPAIN AND LATIN AMERICA

During the Spanish civil war, food and soap were scarce in the loyalist armies but plentiful on the rebel side. Typhus occurred among loyalist soldiers and volunteers, some of whom came from countries where the disease is endemic, but did not appear among the rebel soldiers.. After the war a shifting of population occurred among ex-soldiers and civilians, who returned to their homes in crowded trains or migrated to distant provinces to escape persecution. Then the present war broke out. Manpower became scarce, crops were poor and a large part of the population went to other countries. The economy of the nation collapsed, and typhus automatically appeared.

The first case occurred in Madrid in 1939, eight days after Franco's soldiers entered the town. Shortly afterward many more cases were observed in the southern provinces, where endemic foci had been recognized for a long time, and by July 1941 4,500 cases were recorded. In Madrid alone 1,500 patients were treated, with about 200 deaths. During the rest of that year and in 1942 the disease spread throughout the whole country, the overcrowded prisons being generally responsible for the appearance of new foci. Then, thanks to the strict control measures taken, the disease subsided and finally disappeared.

Clinically the disease was typical of historic typhus. The outbreaks appeared in winter and spring, the condition was exceedingly contagious, the arthropod vector was the louse, and the Weil-Felix reaction with Proteus OX 19 was strongly positive. The mortality was from 18 per cent in the Madrid outbreak to 50 per cent in that of Valladolid, and the condition was fatal among all people older than 60 years.

Little had been written about the disease in Spain; a book was needed summarizing the newer knowledge of typhus and other rickettsial diseases and describing what was learned during the epidemic. Such a book was published in 1941 by Clavero and Perez Gallardo,[1] followed two years later by another, on laboratory methods concerned with diagnosis and prophylaxis. The second book,[2] officially issued by the Ministry of Public Health, is without doubt among the best ever published on the subject in any language. The authors state that the technics described are only those which have been tested in their laboratory. Yet practically none of the known methods are omitted, and most of the numerous illustrations of the text are original.

From these books and from still other publications one learns interesting facts. Gallardo and Sanz Ibañez [3] isolated four strains of rickettsias from different outbreaks and found that, contrary to what might be expected of historic typhus, fever was induced in the rat, fever and orchitis in the guinea pig, and sometimes orchitis in the rat with rickettsias frequently present. In other words, the picture was that considered typical of murine typhus. Yet, as already stated, the clinical pattern was that of historic typhus; wild rats did not prove to be infected and the arthropod vector was the louse and not the flea. The authors rightly concluded that they were dealing with an epidemic of historic typhus producing in the experimental animal the classic biologic reactions of murine typhus.

Their results may be related to those described in Mexico by Ruiz Castañeda, who only a few years ago summarized his observations in another book [4] on the specific prophylaxis of typhus. When Mexican strains of typhus were first isolated by Ricketts, who inoculated monkeys, and by Gabino and Girard, who inoculated guinea pigs, the conclusion was reached that the Mexican and the European or historic typhus were identical. However, Mooser noted in 1928 that Mexican strains produce a disease in the guinea pig different from that induced by European strains. This was the first of a series of observations that led to the concept of the duality of the disease, the concept being upheld by the highest authority in the field, Charles Nicolle.

This conception prevailed until Castañeda,[5] Mooser, Varela and Pilz [6] and others pointed out the presence in Mexico of strains of typhus with characteristics of the historic strains. By animal passages, transformation of these strains into murine strains was obtained.

From all these facts the conception of the fundamental unity of the typhus rickettsia emerges again. Like so many other infectious agents, notably filtrable viruses, the causative rickettsias would be endowed with definite power to undergo variations which result in adaptation to other hosts. Some workers [4] have advanced the hypothesis that murine rickettsias from rat fleas infect men, and by serial transmission from man to man by lice the rickettsias vary from the original murine endemic type and become transformed into rickettsias of historic epidemic type. Utilizing these facts and comparable data from other rickettsial dis-

1. Clavero, G., and Perez Gallardo, F.: Tifus exantematico: etiologia, clinica, profilaxis, Madrid, 1941.

2. Clavero, G., and Perez Gallardo, F.: Técnicas de laboratorio en el tifus exantematico, Madrid, 1943.

3. Gallardo, E., and Sanz Ibañez, J.: Trab. del Inst. Cajal de invest. cient. **32**: 277, 1940.

4. Ruiz Castañeda, M.: Profilaxia especifica del tifo exantematico, Mexico, 1940.

5. Ruiz Castañeda, M.: J. Exper. Med. **52**: 195, 1930.

6. Mooser, H.; Varela, G., and Pilz, H.: J. Exper. Med. **59**: 137, 1934.

eases, recurrent fevers and yellow fever, Baker [7] has recently suggested an extremely imaginative and constructive theory which he calls "the typical epidemic series," the result of the progressive acquisition of virulence by the infectious agent for different species culminating in men, starting from a natural arthropod host.

One finds in Mexico typical historic typhus, typical murine typhus and all sorts of intermediate strains. To complicate the picture still further, Bustamante and Varela [8] have recently identified the so-called Choix fever, or Pinto's fever, in that country with Rocky Mountain spotted fever. Previously Patiño, Afanador and Paul [9] in Colombia and Diaz and Vianna Martius [10] in Brazil had shown the identity of local exanthematic conditions and Rocky Mountain spotted fever, so that the latter disease probably prevails throughout the American continent. Murine typhus has been detected in Caracas,[11] where 6 per cent of rats show a positive Weil-Felix reaction, and strains of rickettsias have been isolated from the brains of some.

Another important contribution from the Madrid laboratories is that by Clavero and Perez Gallardo [12] on the titration of rickettsial antibodies by the Giroud method. Taking advantage of the fact that several species of rickettsias induce typical lesions after intradermal injection, Giroud [13] in 1938 mixed progressive dilutions of test serums with a suspension of rickettsias and studied the modification of the lesions after intradermal injection into rabbits. The Spanish authors have made extensive use of the method and have improved it. The reaction is strictly specific and is no more difficult to carry out than a simple titration of antivaccinial serums. The method should be popularized; there is little doubt that no other of the various technics available for titration of antibodies of any sort —such as the complement fixation test—is as simple, direct and instructive as those based on the modification or suppression of an intradermal lesion.

Prophylactic measures taken during the Spanish epidemic ranged from the simplest and often the most ingenious delousing methods operating in the homes in which cases of typhus occurred to large scale vaccination, several types of vaccines being employed. Clavero and Perez Gallardo assume a noncommittal attitude with regard to the prophylactic value of the vaccines. They mention, though, that those of Weigl, Cox and Laigret have reduced the severity of the infection but have not prevented it. Gallardo, who has satisfactorily modified the Laigret vaccine, is more explicit and states that the good results of applying this vaccine have been manifested by (*a*) the control of new outbreaks in from thirteen to eighteen days, (*b*) the benignity of the disease in vaccinated persons and (*c*) the improved prognosis of patients older than 60 years, with a 50 per cent survival among the vaccinated.

By the use of vaccination, the new "louse powder" and efficient delousing, typhus has been controlled in our army and navy. Epidemic typhus has not appeared among our troops in this war.

7. Baker, A. C.: Am. J. Trop. Med. **23**: 559, 1943.
8. Bustamante, M. E., and Varela, G.: Rex. del Inst. de salubridad y enfernedades tropicales **4**: 189, 1943.
9. Patiño, L.; Afanador, A., and Paul, J. H.: Am. J. Trop. Med. **17**: 639, 1937.
10. Diaz, E., and Vianna Martius, A.: Am. J. Trop. Med. **19**: 103, 1939.
11. Briceño-Iragorry, L.: Gac. méd. de Caracas **50**: 187, 1943.
12. Clavero, G., and Perez Gallardo, F.: Rev. de sanidad e higene púb., 1942.
13. Giroud, P.: Compt. rend. Soc. de biol. **127**: 397, 1938.

THE PRESCRIPTION OF CREAM FOR THE SICK

Under a decision promulgated by the War Food Administration the use of cream with a butter fat higher than 19 per cent is prohibited except that

> a handler may deliver to or for any person or establishment engaged in the care and treatment of the sick, cream or cream products of such milk fat content and in such quantities as may be necessary for supervised medical treatment of the patients of such persons or establishment: *Provided,* That the handler is supplied with a written statement from the patient's physician or, in the case of an establishment engaged in the care and treatment of the sick, from a responsible official thereof who is a practicing physician, and such written statement shall be valid for a period of not to exceed sixty days from the date of issuance and shall specify (i) the milk fat content, (ii) the daily quantity of cream or cream product required for such use, and (iii) with regard to the necessity of such cream or cream product for supervised medical treatment.

Unfortunately these regulations have not served to restrict suitably the prescription of cream of high fat content. The available evidence indicates, for instance, that the equivalent of half a million quarts a day is reported going into heavy cream on doctors' prescriptions in New York City.

The Subcommittee on Medical Food Requirements of the Committee on Drugs and Medical Supplies of the National Research Council adopted a resolution to the effect that there are no medical indications for cream of 40 per cent butter fat content which cannot adequately be satisfied by cream of 19 per cent butter fat content. The Council on Foods and Nutrition of the American Medical Association, which has also given serious consideration to the problem, expresses the opinion that the need for this type of milk product is actually limited to conditions in which the production of dietary ketosis is desired. Presumably the one situation in which a ketogenic diet is believed to be essential at this time is epilepsy. Even in this condition, however, management by the ketogenic diet does not always have first choice because of the difficulties involved in the preparation and ingestion of a ketogenic diet and also because adequate mineral retentions are difficult to obtain with such a diet. After those epileptic patients who respond to customary therapeutic procedures have been excluded, only a few remain for whom it may be desirable to prescribe a ketogenic diet. The consultants of the Council on Foods and Nutrition suggest that prescription of such a diet should be left to the discretion of the physician. A satisfactory 3,000 calory ketogenic diet can be constructed with the use

of 1 pint of heavy cream, a 2,000 calory ketogenic diet with the use of three fourths of a pint of cream. By the use of butter and the salad oils a satisfactory ketogenic diet can be built around a half pint of 19 per cent cream.

Physicians of our country have accepted willingly innumerable special responsibilities imposed on them by the war effort. It would be unfortunate indeed if any individual physician or any group of physicians should hamper the war effort by carelessness in prescribing any of the materials for invalids for which they have been authorized to issue prescriptions.

The control of food supplies, and particularly of fats, is intimately related to the progress of the war. So important is the limitation of cream of butter fat content greater than 19 per cent that officials of the War Food Administration might well require that prescription by a physician for a product of this type for any of his patients definitely indicate the nature of the condition for which the prescription is written and that it be endorsed by such an official as the county health officer or the secretary of the county medical society. Physicians should welcome such restrictions, since a part of the responsibility and burden of the physician will then be shared by some other person in authority.

PLASMA CLOT SUTURE OF PERIPHERAL NERVES

Injuries to peripheral nerves constituted approximately 2 per cent of all injuries during the first world war,[1] and their repair is one of the most important problems in military surgery. Complete restoration of function occurs in only a minority of cases of nerve injury. Many factors may influence recovery after severed nerves have been sutured. Unfavorable results may be caused (*a*) by long delays, so that atrophy of end organs or muscles occurs before the proper surgical treatment is instituted, and (*b*) in cases in which there is extensive damage to nerves, particularly when complicated by impairment of their blood supply or infection. With regard to the surgical technic, the functional results may be influenced by the method of joining the nerve ends.

The conventional method of repairing severed nerves is by the use of thread suture, generally silk. The objections to this method of apposing nerve ends are that: 1. Strangulation of nerve fibers with subsequent fibrosis which interferes with the downgrowth of nerve fibers through the suture site may occur when the sutures are tied, since it is often impossible to confine one's stitches to the epineurium, especially in the case of small nerves with delicate connective tissue sheaths. 2. Knuckling of nerve fibers is apt to occur when the threads are tied, with resultant disturbance of proper longitudinal orientation of nerve fibers at the suture site. 3. The difficulty in inserting the thread sutures at exactly corresponding circumferential points around the stumps may result in some torsion when the sutures are tied, so that sensory fibers may be apposed to motor fibers, with resultant functional loss of misdirected fibers.

Young and Medawar,[2] recognizing the need for an improved technic of nerve suture, conceived the brilliant idea of using clotted plasma instead of silk. They used cockerel plasma (fortified with additional fibrinogen) clotted by chick embryo extract. Tarlov and Benjamin[3] found that autologous plasma prepared without the use of an anticoagulant (unmodified plasma) and allowed to clot spontaneously was sufficiently strong to suture the sciatic nerve of rabbits. The tissue reaction was less and the incidence of separation at the suture site was no greater than with the use of the heterologous substances and, moreover, the preparation of the autologous plasma was simpler.

The original technic of suturing nerves with plasma clot consisted in approximating the ends with jewelers' forceps, depressing the junction into the neighboring tissue to form a trough and adding the plasma and clotting agent. The forceps were withdrawn after clotting occurred. The objections to this technic were that (1) only the upper aspect of the nerve junction could be coated with plasma, (2) some movement of the forceps and nerve ends tended to occur during the several minutes required for the plasma to clot and the apposition was often unsatisfactory, and (3) unless the nerve ends could be placed in a suitable position for the plasma to pool around them the technic could not be used. These shortcomings were overcome by devising a latex mold[4] into which the nerve ends were placed and the plasma poured. Adjustment of the nerve ends on the wire rails of the mold made it possible to obtain accurate apposition. After clotting of the plasma, the wire rails and then the mold were removed. This technic was found satisfactory both as to histologic and as to functional results unless there was some strain at the suture site, when separation tended to occur. This difficulty was overcome by following a suggestion made by Lieut. Col. R. Glen Spurling that tantalum wire tension sutures be used to eliminate the strain at the suture site and plasma clot to guarantee accurate apposition of the nerve ends.[5]

On the basis of the experimental studies, the combined tantalum wire-autologous plasma clot suture of peripheral nerves was carried out in 5 human cases.[6] The results have proved encouraging and apparently justify further clinical trial of this technic.

1. Stookey, Byron, and Scarff, J. E.: Injuries of Peripheral Nerves: Military Surgical Manuals: VI. Neurosurgery and Thoracic Surgery, Philadelphia, W. B. Saunders Company, 1943.

2. Young, J. Z., and Medawar, P. B.: Fibrin Suture of Peripheral Nerves, Lancet **2**: 126 (Aug. 3) 1940.

3. Tarlov, I. M., and Benjamin, Bernard: Autologous Plasma Clot Suture of Nerves, Science **95**: 258 (March 6) 1942.

4. Tarlov, I. M., and Benjamin, Bernard: Plasma Clot and Silk Suture of Nerves, Surg., Gynec. & Obst. **76**: 366 (March) 1943.

5. Tarlov, I. M.; Denslow, C.; Swarz, S., and Pineles, Debora: Plasma Clot of Nerves: Experimental Technic, Arch. Surg. **47**: 44 (July) 1943.

6. Tarlov, I. M.: Plasma Clot Suture of Nerves: Illustrated Technic, Surgery, to be published.

Current Comment

MILK BORNE IMMUNITY

A striking new example of mammary transmission of acquired specific immunity is reported by Berry and Slavin [1] of the University of Rochester School of Medicine. The transfer of humoral antibodies from mother to young by the mammary route was first demonstrated by Ehrlich.[2] Mice born of mothers immune to certain toxic proteins are highly resistant to the same toxins if nursed by their own mothers but are almost wholly nonresistant if foster nursed by nonimmune mothers. Vaillard [3] confirmed these observations. He found that tetanus antitoxin administered after parturition to lactating mothers would confer an effective antitetanus immunity on breast fed young. Practical interest in milk borne immunity was increased by the later demonstration [4] that in domestic cattle the apparently hereditary transmission of natural immunity to environmental saprophytes is dependent on an initial colostrum feeding, the subsequent milk being deficient in the necessary antibodies. An initial feeding with normal cow serum, however, can be substituted for the necessary colostral feeding. Culbertson [5] has recently demonstrated that transfer of active or passive maternal immunity to Trypanosoma duttoni also occurs chiefly after birth. Berry [6] noted that mice at the age of 2 weeks are uniformly susceptible to intranasally instilled herpes virus. The virus regularly invades the central nervous system by way of the trigeminal and olfactory nerves, with almost uniformly fatal results. Adult mice are readily immunized against herpes virus and are then totally refractory to intranasally instilled virus. Berry found that young mice born of such hyperimmune mothers are in turn immune to standard doses of the virus administered intranasally. In order to determine the nature of this apparently hereditary immunity the Rochester investigators studied the effects of foster feeding. They found that mice born of immune mothers and nursed from birth by normal (nonimmune) mothers were fully susceptible to the herpes virus. Out of 25 young mice thus foster fed only 2 survived the routine intranasal test dose (mortality 92 per cent), while 21 control mice born of susceptible mothers and foster nursed by immune mothers were all refractory to the same test dose (mortality nil). On cessation of the immunizing foster feeding the lacteal immunity thus conferred gradually decreases, the young mice becoming normally susceptible in about three weeks. Berry concludes from these observations that the immunity to herpes virus exhibited by the progeny of hyperimmune female mice is the result of passive transfer of humoral antibodies in breast milk, intrauterine transfer of antibodies being a negligible factor in this animal species. Extension of the theory of milk borne immunity to include certain virus diseases has numerous important clinical implications.

1. Berry, G. P., and Slavin, H. B.: J. Exper. Med. **78**: 305, 315 (Oct.) 1943.
2. Ehrlich, Paul: Ztschr. f. Hyg. u. Infektionskr. **12**: 183, 1892.
3. Vaillard, L.: Ann. Inst. Pasteur **10**: 65, 1896.
4. Smith, Theobald, and Little, R. B.: J. Exper. Med. **51**: 473, 483 (March), 519 (April) 1930.
5. Culbertson, J. T.: J. Immunol. **38**: 51 (Jan.) 1940.
6. Berry, G. P., and Slavin, H. B.: J. Bact. **39**: 66 (Jan.) 1940.

NUTRITION IN PUERTO RICO

A recent investigation of the nutritional problems of Puerto Rico [1] discloses that a large percentage of the population exhibits a varying degree of vitamin A deficiency. Biophotometric study of 267 persons taken from the general population revealed that all except 8 had a low dark adaptation curve. In a great majority (81 per cent) of a group of 116 persons, most from the upper economic classes of Puerto Rico, gross examination of the eye revealed conjunctival manifestations of avitaminosis A such as Bitot's spot, increased vascularization, prexerosis and pigmentation. Undoubtedly particular alimentary habits, partly dependent on economic factors, have much to do with the occurrence of a generalized chronic condition of vitamin A subnutrition, in itself an index of the general undernutrition or malnutrition of the population. This may be better illustrated by comparing the average daily ration in the United States with that in Puerto Rico. Dairy products constitute only 10.5 per cent of the daily ration for Puerto Rico as compared to 25 per cent of the daily ration for the United States. Meats and fish make up 4.8 per cent of the Puerto Rican diet and 10 per cent of the North American diet. Green and leafy vegetables form 13 per cent of the diet in the United States and only 5.8 per cent in that of Puerto Rico, while eggs make up 25 per cent of the former and only 0.4 per cent of the latter. Starchy vegetables and cereals, mainly rice, constitute about 50 per cent of the diet in Puerto Rico, whereas in the United States they make up about 25 per cent of the daily ration. On this dietary regimen it should not be difficult to predict the finding of severe nutritional deficiencies in the population of Puerto Rico. Suarez makes a number of practical suggestions to provide a prompt correction of such conditions, such as the organization of an extensive campaign to raise more vegetables and consume more dairy products, the industrialization of shark liver oil and the maintenance of a cafeteria with at least one meal of high nutritional value for industrial and agricultural workers.

1. Suarez, R. M.: Studies of the Nutritional Problem of Puerto Rico, Puerto Rico J. Pub. Health & Trop. Med. **19**: 62 (Sept.) 1943.

NEGRO CENTER FOR MATERNAL CARE

A new maternity center for Negro patients, operated by Negro professional groups under white supervision, has been organized near Birmingham.[1] Slossfield, as it is called, has developed into an important teaching center for Negro physicians and nurses. Already it has served to raise the standards of obstetric and neonatal care given by these two professional groups not only in the center itself but in private practice outside. Both maternal and neonatal mortality have shown a striking reduction. The influence of this endeavor will be widely felt; similar ventures may well be initiated and supported in the North as well as in the South, so that maternal care for Negroes may be elevated to that of the rest of the community.

1. Boulware, T. M., and Stewart, R. C.: A Negro Demonstration Center for Maternal and Newborn Care in Alabama, South. M. J. **36**: 784 (Dec.) 1943.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeons General of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

ARMY

CAPT. NORMAN FRIEDMAN AWARDED DISTINGUISHED SERVICE CROSS

Capt. Norman Friedman, formerly of Hattiesburg, Miss., has been awarded the Distinguished Service Cross "for extraordinary heroism in the face of intense enemy fire on New Georgia Island." The award was made by order of the commanding general of the armed forces in the South Pacific at a ceremony held within the perimeter of the Empress Augusta Bay beachhead on Bougainville Island. Dr. Friedman was cited for his actions on New Georgia Island, where during the battle for Munda air field he was exposed to enemy fire in an effort to give medical assistance to wounded men. On Dibela Hill he was struck and momentarily stunned by shell fragments as he advanced to the aid of a casualty. He continued forward, reached a mortally wounded officer, and then went to the aid of men in the vicinity who were less seriously injured. He succeeded in reaching another officer and, after treating him, directed his evacuation. In the same fire-swept area, he treated and directed the evacuation of a number of wounded from another regiment.

Dr. Friedman was recently appointed assistant regimental surgeon for the infantry regiment of which he is a part. He has seen service on Guadalcanal and Bougainville. In addition to his other duties, he assisted in the making of training films concerning medicine in combat. These films were made almost within view of the enemy, thus assuring an accurate documentary record of the treatment of casualties in the field.

Dr. Friedman graduated from the University of Berne, Switzerland, in 1935 and entered the service in October 1940.

ASSIGNMENT OF SPECIALLY QUALIFIED OFFICERS TO GENERAL HOSPITALS

Army Service Forces Circular No. 30, issued January 26, part 3, contains information concerning the assignment of specially qualified officers to general hospitals, stating that, to the maximum extent practicable, officers of company grade who have been wounded in action, are classified limited service, are superior in leadership and are physically and mentally suited to such duties will be assigned to duty with detachments composed of convalescent patients, especially battle casualties, who are in convalescent reconditioning sections of general hospitals. The primary duty of these officers will be to assist the officer in charge in administrative details and in the military and physical reconditioning of these patients. It is not intended that they replace M. A. C. officers. Not more than one such officer will be assigned to each hundred trainees in the described detachments. It is strongly recommended that no officer be assigned to these detachments unless he is considered qualified by the service command surgeon.

NURSE A PRISONER OF WAR

A letter was recently received by the father of Lieut. Ruby G. Bradley, Army Nurse Corps, written from a civilian internment camp in the Philippines, where she is being held a prisoner of war. Lieutenant Bradley, who was stationed at Walter Reed Hospital, Washington, D. C., before being sent to the Philippines in 1939, was acting chief nurse at Camp John Hay, Baguio, Philippine Islands, at the outbreak of the war. She graduated from Philadelphia General Hospital in 1933 and enlisted in the Army Nurse Corps in 1935.

CIVILIAN PHYSICIANS MAY OBTAIN RECORDS OF ARMY PATIENTS

Commanding officers of hospitals are now authorized to furnish clinical and professional records of former patients to practicing physicians who may need them for subsequent treatment. A recent change in Army Regulation 40-590 provides that "The commanding officer is authorized to furnish information from clinical and other professional records of patients who have been treated or are receiving treatment in hospital directly to the following: to practicing physicians such professional information as is required by them in the treatment of any member or former member of the military service."

NOMINATE FOUR BRIGADIER GENERALS IN MEDICAL CORPS

Among the forty-two temporary promotions to brigadier generals recently announced by the President, the following were in the Army Medical Corps: Brig. Gen. Joseph I. Martin, Chicago; Brig. Gen. Earl Maxwell, Fort Leavenworth, Kansas; Brig. Gen. Guy B. Denit, Salem, Va.; Brig. Gen. Edgar E. Hume, Frankfort, Ky.

PRISONER OF WAR

Word was recently received from Major Willard H. Waterous of Manila that he is being held a prisoner of war in Military Prison Camp No. 3, Manila, P. I., and that since the fall of Bataan and Corregidor he has been taking care of military prisoners of war. Dr. Waterous made his home in Manila for nearly twenty-five years. He joined the army when war was declared, underwent the bombardment of Manila on Dec. 27, 1941 and when the city was occupied by the Japanese on Jan. 2, 1942 retreated with General MacArthur's forces to Bataan Peninsula, which withstood terrific attacks before falling, April 9, 1942. Dr. Waterous graduated from Northwestern University School of Medicine, Chicago, in 1916.

ARMY PERSONALS

1st Lieut. Silvio Del Chicca, formerly of Chicago, recently was transferred from the station hospital at Fort Benjamin Harrison, Indiana, to the Army Service Forces Depot in Columbus, where he will assume his duties as assistant depot surgeon. Dr. Del Chicca graduated from the University of Florence, Italy, in 1927 and entered the service Oct. 7, 1943.

Lieut. Col. Frank C. Svoboda, formerly of San Diego, Calif., has been appointed commanding officer of the station hospital at Lake Charles Army Air Field, Lake Charles, La., succeeding Lieut. Col. James H. Dameron, who was recently transferred. Dr. Svoboda graduated from Creighton University School of Medicine, Omaha, in 1925 and entered the service in August 1941.

Capt. Jean Henderson, formerly of Stamford, Conn., is the first woman physician from that state to be commissioned in the armed forces in the Medical Corps of the Army. It is reported that she has recently been assigned to the station hospital at Fort Knox, Kentucky. Dr. Henderson graduated from Columbia University College of Physicians and Surgeons, New York, in 1931 and interned at Bellevue Hospital. Before entering the Army Dr. Henderson was a member of the pediatric service, Stamford Hospital.

NAVY

LIEUT. COMDR. MILES C. KREPELA AWARDED LEGION OF MERIT

Lieut. Comdr. Miles C. Krepela, formerly of New York City, has been awarded the Legion of Merit. The citation accompanying the award is as follows: "For exceptionally meritorious conduct in the performance of outstanding services to the Government of the United States as Senior Medical Officer attached to a Defense Battalion operating against enemy Japanese forces in the New Georgia Area during the early stages of that campaign in July 1943. Stationed with his medical staff on Rendova Island at a point which was the chief target for enemy bombers, Lieutenant Commander Krepela gallantly refused to be moved to a safer area and remained to care for the wounded who were being brought in from the beach. Owing to the extreme shortage of doctors and corpsmen in that dangerous area he worked day and night for seven days, skilfully directing his limited medical personnel and assisting in the treatment and evacuation of our wounded troops. By his great courage and tireless devotion to duty he was an inspiration to his staff and patients and undoubtedly saved many lives which otherwise might have been lost." Dr. Krepela graduated from McGill University Faculty of Medicine, Montreal, in 1930 and entered the service in June 1940.

LIEUT. FERRALL H. MOORE AWARDED LEGION OF MERIT

The Bureau of Naval Personnel Information Bulletin recently announced the award of the Legion of Merit to Lieut. Ferrall H. Moore. The citation accompanying the award read: "As medical officer in charge of the evacuation of casualties at Henderson Field, Guadalcanal, from Nov. 30, 1942 to Feb. 4, 1943 Lieutenant Moore instituted a plan which facilitated the loading and evacuation of patients. His efficiency in handling aircraft flight crews, sick and wounded made possible the transfer of several hundred men to base hospitals by air without a fatality en route." Dr. Moore graduated from the University of Nebraska College of Medicine, Omaha, in 1932 and entered the service June 4, 1942.

ARMY SILVER STAR GIVEN TO NAVY DOCTOR

Lieut. James F. Regan, commanding officer of a navy medical detachment serving with a marine raider battalion, was recently presented with the Army Silver Star for gallantry in action on New Georgia, Solomon Islands, during the operations against the enemy there last July. The citation accompanying the award read in part as follows: "Dr. Regan directed the activities in the care of and aided the evacuation of over 200 casualties, including 72 litter (stretcher) cases, in areas covered by enemy small arms, machine gun and mortar fire during the period from July 8 to July 21." Dr. Regan graduated from the University of Chicago Department of Medicine in 1934, and entered the service in July 1942.

ADMIRAL WILLIAM F. HALSEY PRAISES TWO NAVAL MEDICAL CORPS OFFICERS

Lieut. John N. Marquis, formerly of Charleston, W. Va., was cited by Admiral William F. Halsey, U. S. Navy, for courageous conduct during the landing on Treasury Island in October 1943. The citation read as follows: "For meritorious performance of duty while serving as a medical officer on board a tank landing ship during the initial landing on Treasury Island Oct. 27, 1943. Lieutenant Marquis distinguished himself by his foresight and efficient planning for the care of the wounded during the operation. He stayed with the wounded and gave first aid under extremely adverse circumstances. Later, he performed many major operations on the seriously wounded for a period of forty-eight hours with little rest, during which time his ship was under enemy fire from the beach and later attacked by enemy planes as they were retiring. His courageous conduct was in keeping with the highest traditions of the United States Naval Service."

Lieut. Comdr. Tracy D. Cuttle, formerly of Philadelphia, and Dr. Marquis were praised for their remarkable ingenuity during the landing on Treasury Island just prior to the attack on Bougainville. By cutting holes in the deck of their ship, they were able to lower the wounded into wards that had been set up around an emergency operating room. This made it unnecessary to transfer equipment to the beachhead and at the same time afforded means of treating the wounded en route to a hospital. Dr. Marquis and Dr. Cuttle performed fifteen major operations and administered 120 units of blood plasma in a forty-six hour period while the ship was under way. Dr. Marquis and Dr. Cuttle graduated from the University of Pennsylvania School of Medicine, Philadelphia, in 1931 and 1935 respectively. Dr. Marquis entered the service May 20, 1942 and Dr. Cuttle Dec. 8, 1941.

COMMANDER OF U. S. S. MINNEAPOLIS PRAISES MEDICAL OFFICER

A recent release from the Navy Department stated that Rear Admiral Charles E. Rosendahl, former commander of the U. S. S. *Minneapolis*, commended Lieut. Harry R. Walker, U. S. Navy Medical Corps, and his assistants for their work in treating the injured on board the *Minneapolis* during the battle which took place off Guadalcanal on Nov. 30, 1942. The thirty-five men most seriously injured were transferred to a hospital ashore at Tulagi, and not 1 case transferred required further operative treatment. Every injured casualty aboard the *Minneapolis* recovered. Dr. Walker graduated from the University of Louisville School of Medicine in 1939 and entered the service Aug. 11, 1941.

LIEUT. COMDR. MARION T. MARTIN AWARDED SILVER STAR MEDAL

Lieut. Comdr. Marion T. Martin, formerly of Washington, D. C., was recently awarded the Silver Star Medal. The citation accompanying the award read as follows: "Lieut. Comdr. Marion T. Martin (MC), U.S.N.—to provide medical attention for wounded personnel being evacuated from Guadalcanal by air, Lieutenant Commander Martin initiated a service to care for casualties en route and voluntarily accompanied evacuees on numerous flights through hostile skies in unarmed and unprotected transport planes. During frequent periods of heavy bombardment by Japanese warships he worked his way across heavily shelled areas to relieve suffering men." Dr. Martin graduated from the University of Tennessee College of Medicine, Memphis, in 1939 and entered the service after the completion of his internship in 1941.

LIEUT. JOHN B. CLEMENT RECEIVES PURPLE HEART AWARD

Lieut. John B. Clement, formerly of Beverly and Trenton, N. J., now serving in the Navy Medical Corps, has received the Purple Heart and a commendation for "bravery under enemy fire." Dr. Clement was a graduate of the Medical College of Virginia, Richmond, in 1933 and entered the service Feb. 22, 1943.

PERSONAL

Dr. Elizabeth G. Sunners of Long Island City, N. Y., is the first woman member of the Medical Society of the County of Queens to enter any of the branches of military service. She was recently commissioned an officer in the SPARS with the rank of lieutenant commander and has been ordered to Long Beach, Calif., for active duty. Dr. Sunners graduated from the University of Vermont College of Medicine, Burlington, in 1930.

MISCELLANEOUS

TWENTY-ONE WAR SESSIONS TO BE HELD BY AMERICAN COLLEGE OF SURGEONS

The American College of Surgeons, Chicago, selected twenty-one cities distributed throughout the United States and Canada as headquarters for one day war sessions to be held from February 28 to April 27. The meetings will be open to the profession at large, including medical officers of the Army and Navy, residents, interns, medical students and executive personnel in hospitals. For the latter, special hospital conferences, to be held simultaneously with the scientific sessions, are being arranged. Those who plan to attend the war sessions may select the meeting which in time or place is most convenient, regardless of the states and provinces, which, for the purposes of organization, are designed on the schedule as participating in a given meeting. Representatives of the United States Army, Navy, Public Health Service, Veterans Administration, Procurement and Assignment Service and the Office of Civilian Defense have been assigned to participate in the meetings. In Canada the corresponding agencies are also assigning official representatives. Experiences of medical officers who have been on active duty in combat zones will be especially featured. In the hospital conferences such agencies as the War Production Board, the War Manpower Commission, the American Red Cross and groups interested in student nurse recruitment will be represented.

The schedule for the meetings is as follows:

Date	City	States and Provinces	Headquarters
Feb. 28	Winnipeg	Manitoba, Saskatchewan	The Fort Garry
March 2	Minneapolis	Minnesota, North Dakota, South Dakota	Hotel Nicollet
March 4	Des Moines	Iowa, eastern Nebraska, Missouri	Hotel Fort Des Moines
March 6	Chicago	Illinois, Wisconsin	The Stevens
March 8	Cincinnati	Ohio, Kentucky, Indiana, West Virginia, Tennessee	Netherlands Plaza
March 10	Detroit	Michigan	Hotel Statler
March 13	Rochester	New York State	Seneca Hotel
March 15	Toronto	Ontario	Royal York Hotel
March 17	Montreal	Quebec, New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland	Mount Royal Hotel
March 20	Springfield	Massachusetts, Maine, New Hampshire, Vermont, Rhode Island, Connecticut	Hotel Kimball
March 22	Philadelphia	Pennsylvania, New Jersey, Delaware	The Bellevue-Stratford
March 24	Baltimore	Maryland, District of Columbia, Virginia, North Carolina	Lord Baltimore Hotel
March 27	Jacksonville	Florida, Georgia, Alabama, South Carolina	The George Washington
March 31	San Antonio	Texas, Louisiana, Mississippi, New Mexico, Mexico	The Gunter Hotel
April 4	Tulsa	Oklahoma, Kansas, Arkansas	The Mayo
April 7	Denver	Colorado, Wyoming, Western Nebraska	Shirley-Savoy Hotel
April 11	Salt Lake C'y	Utah, southern Idaho	Hotel Utah
April 14	Spokane	Washington, northern Idaho, Oregon, Montana	Davenport Hotel
April 18	Vancouver	British Columbia, Alberta	Hotel Vancouver
April 24	San Francisco	Northern California, Nevada	Hotel Mark Hopkins
April 27	Los Angeles	Southern California, Arizona	The Biltmore Hotel

SCARCITY OF SOAP AND PHARMACEUTICALS IN BELGIUM

Information received from the National War Fund, New York City, through its member agency, the Belgian War Relief Society, states that conditions in occupied Belgium are such that doctors and surgeons in hospitals there must wash their hands with a soap substitute made of clay, ordinary soap being scarce. In the black market, however, soap sells for 60 francs a kilogram (about 87 cents a pound). It was further stated that in Belgium today bandages and dressings, washed and sterilized, have to be used over and over again, since the occupation authorities have commandeered all available supplies. Iodine and petrolatum are unobtainable, and certain surgical instruments and syringes have become very scarce.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quotas allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, February 12, p. 446)

NEW JERSEY

Monmouth Memorial Hospital, Long Branch. Capacity, 215; admissions, 6,431. O. N. Auer, Director (3 interns).

OHIO

St. Thomas Hospital, Akron. Capacity, 148; admissions, 5,592. Sister M. Eleanor, Superintendent (intern, assistant resident, April 1).

MILITARY DEATHS OF BELLIGERENTS IN 1943

In the present war, military death losses in action for all belligerents amounted to approximately 2,000,000 in 1943, according to a recent release by the Metropolitan Life Insurance Company, New York. Statisticians say that the year 1943 was the second year in succession to show a military death toll of 2,000,000, and the third in which it was on a scale comparable to that of the first world war. The 27,000 American military death losses include deaths among the wounded and an allowance for probable deaths among those now listed as missing. They do not include, however, deaths of Americans in axis prison camps, of which several thousand have been reported. U. S. military death losses were about double those of 1942. There was a sharp shift in comparative losses between the Army and Navy—the army battle fatalities were about double those of the Navy (including the Marines and Coast Guard) in 1943, while in 1942 the Navy losses were larger.

Japanese battle deaths in 1943 were estimated to be over 100,000, considerably less than in 1942. The total German losses in 1943 exceeded those in either of the two preceding years, the estimated total being 850,000 and perhaps more than a million. For the first time they exceeded Russian losses, which for 1943 were probably about 600,000. The losses of the countries of the British Empire rose in 1943 to an estimated figure of 75,000 lives. Total losses for other belligerents in 1943 were reported to be considerable, and although Italy was knocked out of the fighting late last summer more than 50,000 Italian soldiers and sailors were killed in battle in 1943. Rumania's losses were reported to be as high as 50,000. Battle deaths of the Chinese were estimated to be between 25,000 and 50,000. Yugoslavs also lost heavily in their guerrilla fighting against the axis, while French units in the military forces of the United Nations lost about 3,000 men.

HEALTH UNDER HITLER

According to *Vocher* (Bulgaria) of Oct. 8, 1943 the Chief Public Health Directorate, wishing to increase the reserve stocks of quinine for those suffering from malaria, has imported larger quantities of proquinine, containing 47.5 per cent cinchonine, 47.5 per cent of cinchonidine and 5 per cent of quinidine. The action of the proquinine is identical with that of quinine. The two drugs can be used together in the ratio of 2:1. The directorate advises doctors to prescribe proquinine instead of quinine.

DNB (for Europe) November 1 (Poland) reports from Cracow: The fight against epidemics takes a prominent place in the medical attention given to the Polish and Ukrainian population in the general government. Since the general government was set up, more than one hundred hospitals for epidemic diseases have been established to combat typhus (fleckfieber). Numerous delousing institutes were constructed and more than one thousand mobile decontamination chambers (entwesungskämmern) were sent to the general government from Germany.

ORGANIZATION SECTION

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. 1509 has been reported to the Senate with recommendation that it pass, providing for the education and training of members of the armed forces and the Merchant Marine after their discharge or conclusion of service. Such education and training may be given in public or private elementary, secondary and other schools furnishing education for adults, business schools and colleges, scientific and technical institutions, colleges, vocational schools, junior colleges, teachers' colleges, normal schools and professional schools and universities. Provision is made too for apprentice or other training on the job. H. R. 1506 has passed the House, proposing further to amend the Pay Readjustment Act of 1942. This bill, among other things, would permit service in the Medical Reserve Corps to be counted for pay purposes. H. J. Res. 208 has passed the House and Senate and has been transmitted to and approved by the President. This law, in making appropriations to assist in providing a supply and distribution of farm labor for the calendar year 1944, authorizes the furnishing of health and medical services to (*a*) agricultural workers and their families housed in any labor supply center operated as a part of the program or (*b*) migratory agricultural workers and their families who, without recruitment or assistance of any government agency, have entered the area served by any such labor supply center and are engaged in agricultural work in such area and to whom adequate health and medical services are not otherwise available.

Bills Introduced.—The President has transmitted to the Congress supplemental estimates of appropriation for the Federal Security Agency in the amount of $3,200,000 to be used to complete for the present fiscal year the current nurse training program. Another supplemental estimate for the Federal Security Agency, in the amount of $11,350,000, has been transmitted to the Congress by the President, for additional grants to states for old age assistance. The President too has transmitted to the Congress drafts of proposed legislation (1) to authorize the transfer of necessary funds from the 1944 appropriations of the War and Navy departments to defray costs to be assumed by the Selective Service System with respect to the transportation of registrants in connection with preinduction physical examinations and (2) to authorize the Selective Service System to pay for emergency medical and hospital treatment and the transportation and burial of the remains of registrants when such expenses arise while registrants are under orders of the Selective Service System.

STATE MEDICAL LEGISLATION

Kentucky

Bills Introduced.—H. 213 proposes that any county containing a city of the second class may by joint action of the fiscal court of the county and the legislative body of the city establish a city-county health department to be governed by a city-county board of health. H. 234, to amend the law relating to the state board of health, proposes that the board shall consist of the commissioner of health and eight members appointed by the governor. Of the members of the board, the bill provides, one must be a registered pharmacist, one a homeopathic physician, one an eclectic physician, one an osteopath and the remainder nonsectarian physicians. H. 259, to amend the narcotic drug act, proposes so to define narcotic drugs within the meaning of that act as to include isonipecaine, which the bill states is "the substance identified chemically as 1-methyl-4-phenyl-piperidine-4-carboxylic acid ethyl ester, or any salt thereof by whatever trade name identified."

Mississippi

Bills Introduced—S. 126 proposes to condition the issuance of a license to marry on the presentation by each party to the proposed marriage of the certificate of a licensed physician that he has within thirty days prior to the date of application for a license examined the applicant and has caused stated laboratory examinations to be made to ascertain the presence of venereal disease. If the presence of venereal disease is ascertained the examining physician shall issue his certificate only after both parties to the proposed marriage are notified of the presence of such venereal disease and only after the applicant having the venereal disease has been administered such treatment as is prescribed by the state board of health. S. 130, to supplement the medical practice act, proposes to authorize the state board of health to license without examination all bona fide residents of the state who have served as physicians in the armed forces of the United States and who have not been able to apply for licenses and take examinations since graduating from accredited medical schools. H. 252 proposes to authorize the establishment and operation of a North Mississippi State Charity Hospital and Nurses' Home to be located in or near the city of Tupelo, Lee County. H. 265, H. 266 and H. 267 propose to appropriate $100,000 for the establishment and maintenance of a separate department at the Mississippi State Hospital at Whitfield for the treatment of neurosyphilis or other diseases leading to insanity. H. 269 proposes to authorize the establishment and maintenance of a Central Mississippi State Charity Hospital and Nurses' Home to be located in or near the city of Carthage, Leake County. House Concurrent Resolution 27 proposes to create a joint committee of four members of the House and three members of the Senate to make a study of workmen's compensation laws with a view of making recommendations to the 1946 session of the legislature. H. 270 and H. 271 propose to enact an act to provide for the payment of compensation for injuries to or death of employees arising out of employment.

New York

Bills Introduced.—S. 589 and A. 813 propose to enact a separate chiropractic practice act and to create an independent board of chiropractic examiners to examine and license applicants for licenses to practice chiropractic, which is defined as "the science of locating and the removing of nerve interference in the human body, according to chiropractic principles, where such interference is the result of or caused by misalinement or subluxations of the vertebral column. It excludes operative surgery, the reduction of fractures, the prescription or use of drugs or medicine and the practice of obstetrics." A. 446 proposes to require hospitals to permit the performance of ritual circumcision on a male child born therein, in accordance with the Orthodox Hebrew religious requirements. A. 719, to amend the workmen's compensation act, proposes to permit an injured employee when dental care is required to select any dentist to treat him who is authorized to do so. A. 740, to amend the workmen's compensation act, proposes that every employee mentally disabled as the result of an industrial accident shall be entitled to receive, without any deductions from the amount of compensation payable to him, medical care, maintenance and attendance in a public hospital or institution at the expense of his employer until such time as he is discharged from the hospital as cured. A. 768 proposes to provide for the hospitalization, treatment and rehabilitation of persons discharged for disability from the armed forces of the United States who have non-service connected mental disabilities and who at the time of entry into the armed forces were residents of the state and who are ineligible for hospitalization in United

States Veterans Administration facilities. S. 663, to amend the laws relating to the practice of chiropody, proposes to permit any licentiate in podiatry to use the title "doctor" or the abbreviation "Dr." if such use is qualified by the designation podiatrist and/or chiropodist.

South Carolina

Bills Introduced.—S. 783 and H. 945, to amend the uniform narcotic drug act, propose so to define narcotic drugs within the meaning of that act as to include isonipecaine, which the bill states is "the substance identified chemically as 1-methyl-4-phenyl-piperidine-4-carboxylic acid ethyl ester, or any salt thereof by whatever trade name identified."

Virginia

Bills Introduced.—S. 103 proposes to make incurable insanity a ground for divorce if the insane spouse has been continuously confined in a state or federal hospital or facility for five years or more. S. 105, to amend the workmen's compensation act, proposes to make compensable a disability arising from occupational disease, which the bill proposes to define as "a disease arising out of and in the course of the employment." The bill further provides that no ordinary diseases of life to which the general public is exposed outside of the employment shall be compensable, except when it follows as an incident of occupational disease as defined in the law.

WOMAN'S AUXILIARY

Arkansas

Members of the Southeastern Arkansas Medical Society were guests of the woman's auxiliary at their annual Christmas dinner. A letter to each of the fourteen members who are in service was signed by those present.

The Pulaski County Auxiliary had a public relations meeting recently, with Dr. Paul Eschweiler talking on the blood bank.

District of Columbia

The Woman's Auxiliary to the District Medical Society elected the following officers: Mrs. Fred R. Sanderson, president; Mrs. L. A. Martel, first vice president; Mrs. Charles H. McEnerey, second vice president; Mrs. J. Chester Brady, recording secretary; Mrs. E. J. Cummings, corresponding secretary; Mrs. Thomas Crisp, treasurer; Mrs. E. L. Morrison, parliamentarian; Mrs. Albert E. Marland, historian.

A number of auxiliary members assisted the medical society during the fifteenth annual scientific assembly in October. At the October meeting of the auxiliary $120 was given to the Community War Fund and $105 to purchase Red Cross Christmas boxes for American prisoners of war.

At the November meeting of the Auxiliary to the Medical Society of the District of Columbia a film, "The Last Will and Testament of Tom Smith," was shown, and a talk on "China" was given by Mr. William R. Johnson. The auxiliary made 3,000 surgical dressings and many comfort kits for the soldiers. They recently raised $250 to be used for equipping mobile battle stations.

Florida

The Florida auxiliary recently elected the following officers: Mrs. F. W. Krueger, Jacksonville, president; Mrs. C. H. Murphy, Bartow, first vice president; Mrs. P. J. Manson, Miami, second vice president; Mrs. William H. Ball, Jacksonville, corresponding secretary; Mrs. W. C. Williams, West Palm Beach, secretary and treasurer; Mrs. J. L. Anderson, Coral Gables, historian; Mrs. L. F. Robinson, Fort Lauderdale, parliamentarian.

The Duval County auxiliary recently met at the home of Mrs. C. F. Henley, Jacksonville. Reports were given concerning work at Atlantic Beach and Camp Blanding, where auxiliary members helped furnish rooms with games and radios for the medical units.

Indiana

The board of the Indiana auxiliary met recently in Indianapolis with Mrs. James Baxter Jr., president, presiding.

Dr. Morris Fishbein, editor of THE JOURNAL, gave a talk before the Howard County auxiliary, January 18, at Kokomo.

Major Philip Rossman of the Baer Field Medical Unit spoke on "Military Medicine" at the November meeting of the Allen County auxiliary.

The Marion County auxiliary entertained at a tea at the governor's mansion. The wives of medical officers stationed at Billings General Hospital, Fort Benjamin Harrison, Camp Atterbury, and Stout Field, 125 members and guests were present.

The Vigo County auxiliary recently devoted a day sewing for Bundles for America and the Red Cross.

Iowa

The Iowa auxiliary recently elected the following officers: Mrs. W. S. Reiley, Red Oak, president; Mrs. J. C. Decker, Sioux City, president-elect; Mrs. A. G. Felter, Van Meter, secretary; Mrs. A. E. Merkel, Des Moines, treasurer. Mrs. Chapler, chairman of press and publicity for Iowa, reprinted "The Credo of the Doctor's Wife in Wartime," by Mrs. William Hibbitts of Texas. She also gave a short report of the Dallas-Guthrie auxiliary and the auxiliaries to the Pottawattamie and Montgomery county medical societies, which, with the medical societies, held a dinner meeting in Red Oak in November.

Mississippi

The executive board of the Mississippi auxiliary met in Jackson recently at the home of Mrs. H. C. Ricks, president.

Members of the Northeast Mississippi Thirteen Counties Auxiliary met recently. Dr. M. Y. Dabney talked on "The Doctor's Wife's Place in the War Effort."

Ohio

Interesting meetings were reported by the auxiliaries of the Hamilton, Highland, Knox, Ross and Lucas counties.

Virginia

The Woman's Auxiliary to the Medical Society of Virginia held its twenty-first annual meeting recently in Roanoke. Mrs. H. W. Rogers, president, Norfolk, presided at all sessions except the postconvention board meeting, at which Mrs. Clyde West, Alexandria, the newly inducted president, presided.

Officers of the Virginia auxiliary are Mrs. W. Clyde West, president, Alexandria; Mrs. Paul C. Pearson, president-elect, Turpin; Mrs. C. C. Smith, secretary, Norfolk; Mrs. N. G. Schuman, corresponding secretary, Alexandria; Mrs. Reuben F. Simms, treasurer, Richmond, and Mrs. E. Latene, chairman press and publicity, Flanagan.

OFFICIAL NOTES

DOCTORS AT WAR

Radio broadcasts of Doctors at War by the American Medical Association in cooperation with the National Broadcasting Company and the Medical Department of the United States Army and the United States Navy are on the air each Saturday at 4:30 p. m. Eastern war time (3:30 Central war time, 2:30 Mountain war time and 1:30 Pacific war time).

The titles and guest speakers for the next three programs are as follows:

February 19. "Hometown Heroes."
Speaker, James A. Paullin, M.D., President American Medical Association.

February 26. "Share and Share Alike."
Speaker, Col. Rohland A. Isker, Subsistence Research Laboratory, Chicago.

March 4. "New Life Preserver."
Speaker, Capt. W. M. Craig (MC), U.S.N.R.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Personal.—Dr. Wilton L. Halverson, Los Angeles, director of the state department of public health, has recently been appointed to the board of scientific directors of the International Health Division of the Rockefeller Foundation.

Fellowship in Pharmacology Established.—The Winthrop Fellowship in pharmacology has been established at Stanford University School of Medicine, San Francisco, for use in training doctors of medicine in teaching or research in the field of pharmacology. The fellowship is to be financed by a grant of $1,500 from the Winthrop Chemical Company, Rensselaer, N. Y.

Physicians Needed.—Doctors of medicine are being sought by the Los Angeles County Civil Service Commission to render professional care in the treatment of patients in a county institution. Doctors under 55 years of age who have graduated with an M.D. degree from an approved medical school and who have completed at least nine months' internship in an approved hospital are urged to apply. Applicants for this $290 to $345 a month position must possess or be able to secure promptly a certificate to practice in California. The last day for filing of applications is Saturday, March 4. Applications and full information are obtainable from the office of the commission, 102 Hall of Records, Los Angeles 12.

DISTRICT OF COLUMBIA

New Juvenile Court Clinic.—Stanley W. Geshell, passed assistant surgeon, United States Public Health Service Reserve, has been named psychiatrist for the new Juvenile Court Clinic opened in Washington recently.

Personal.—Dr. James Ross Veal has resigned as resident chief medical officer in the department of surgery at Gallinger Municipal Hospital to enter private practice.——Dr. Edgar A. Bocock has resigned as medical superintendent of Gallinger Municipal Hospital, a position he had held for sixteen years.

FLORIDA

Personal.—Dr. Victor P. Genge, director of the Lake County Health Department, Tavares, has been appointed in charge of the Highlands-Glades Health Unit, succeeding Dr. Paul J. Coughlin, Sebring.——Dr. Harry C. Galey was recently appointed health officer of Key West.

Campaign Against Venereal Disease.—The Florida State Board of Health has been conducting a statewide educational campaign against venereal disease under the auspices of Dr. Roger F. Sondag, Sarasota, director of the division of venereal disease control. Educational features include the distribution of literature, the publishing of newspaper advertisements and radio broadcasts. In an effort to reach every home in the state, literature was distributed from house to house by civilian defense block leaders, and pamphlets were enclosed in all light and department store bills.

ILLINOIS

Society News.—The Henry County Medical Society, Kewanee, was addressed, February 10, by Dr. Donald D. M. Cook, Chicago and Lake Zurich, on "The Cook-Fuller Theory of the Cause of Gastric and Duodenal Ulcer: The Newer Concept of the Medical and Surgical Treatment of Ulcer." Dr. Cook and Dr. Muriel K. Fuller, Chicago, addressed the Peoria County Medical Society, Peoria, February 15, on the same subject.

Chicago

Cancer Forum.—"Cancer of the Stomach" will be the theme of a forum for the public, February 21, at the John B. Murphy Auditorium, under the auspices of the Chicago Cancer Committee. The speakers will include:

Dr. Ludvig Hektoen, Introductory Statement.
Dr. James P. Simonds, The Nature of the Disease.
Dr. Walter L. Palmer, Diagnosis and Symptoms.
Dr. Warren H. Cole, Treatment and Results.
Dr. Morris Fishbein, Editor, THE JOURNAL, Tracking Down the Cancer Charlatan.

Leo M. Lyons, executive director of St. Luke's Hospital, will be the moderator at the forum, which is the fifth in a series for the public sponsored by the cancer committee.

Clinical Conference.—The Chicago Medical Society will hold its first annual clinical conference at the Stevens Hotel, March 14-17. Among the speakers will be:

Dr. Walter L. Palmer, Amebiasis and Dysentery.
Dr. James T. Case, Value of X-Rays in the Study of Postoperative Emergencies and Complications.
Dr. Henry G. Poncher, The Clinical Significance of Spontaneous Hemorrhage.
Lieut. W. Allen Conroy, M. C., A. U. S., Anesthetic Emergencies.
Dr. Edward G. Waters, New York, The Use and Abuse of Cesarean Section.
Dr. Harold A. Vonachen, Peoria, Ill., The Employment of the Handicapped.
Dr. Lewis J. Pollock, War Neuroses—Their Rehabilitation and Absorption into Industry.
Dr. Willard O. Thompson, Recent Advances in Endocrinology.
Dr. Bert I. Beverly, Fears and Anxieties in Children.
Dr. Donald G. Anderson, Boston, Penicillin.
Dr. Karl D. Figley, Toledo, Ohio, This Thing Called Allergy.
Dr. Noble Sproat Heaney, Differential Diagnosis and Treatment of Ectopic Pregnancy.
Dr. Paul C. Bucy, The Management of Acute Head Injuries.
Dr. Walter C. Alvarez, Rochester, Minn., Heartburn.
Brig. Gen. Fred W. Rankin, M. R. C., Surgery of the Colon.
Drs. Louis N. Katz and James Roscoe Miller, The Clinical Aspects of Heart Block.
Lieut. Col. Worth B. Daniels, M. C., A. U. S., Meningococcic Septicemia and Meningitis.
Dr. William C. Danforth, Evanston, Ill., Management of Prolonged Labor.
Dr. Paul H. Holinger, Bronchoscopy in Pulmonary Diseases of Childhood.
Drs. Kellogg Speed and William R. Cubbins, Fractures. Dr. Speed, general principles of treatment and Dr. Cubbins, a common individual type.
Dr. Herman L. Kretschmer, Urology (title not announced).
Lieut. Comdr. David H. Rosenberg (MC), U. S. Naval Reserve, Rheumatic Heart Disease.
Dr. Frederick P. Moersch, Rochester, The Abuse of Sedatives in Medical Practice.
Col. Esmond R. Long, M. C., A. U. S., Some Aspects of the Tuberculosis Problem.
Lieut. Col. Charles M. Caravati and Capt. Robley D. Bates Jr., M. C., A. U. S., Malaria.
Dr. William J. Dieckmann, Prevention and Treatment of Eclampsia.
Dr. E. W. Alton Ochsner, New Orleans, Peritonitis.
Dr. Herman C. Schumm, Milwaukee, Trends in the Care of the Infantile Paralysis Patient.
Dr. Adolph Hartung, Obscure Abdominal Tumors: Now the Roentgen Examination Can Aid in Their Diagnosis.
Dr. Henry N. Harkins, Baltimore, Surgical and Medical Management of Burns.
Dr. Henry Close Hesseltine, Gynecologic Disorders Among Industrial Workers.
Dr. Roy G. Hoskins, Boston, The Practical Side of Endocrinology.
Dr. Roy R. Kracke, Emory University, Ga., Effects of Drugs on the Blood.
Dr. Hugo V. Hullerman, Springfield, Ill., Emergency Maternal and Infant Care—How It Affects the Doctor.
Dr. John Albert Key, St. Louis, Complications on External Fixation of Fractures.
Dr. Drew William Luten, St. Louis, Coronary Disease.
Dr. Israel Davidsohn, Chicago, Cause of Reactions in Blood Transfusions.

Diagnostic clinics will be conducted by Drs. Alexander Brunschwig; Earl D. Osborne, Buffalo; Glenway W. Nethercut; Charles M. McKenna; Edward A. Oliver; I. Pat Bronstein, Herbert E. Schmitz, Janet E. Towne and James H. Mitchell. Other features of the meeting will be a surgical panel on "Blood and Blood Substitutes" by Drs. Lester R. Dragstedt, Karl A. Meyer, Sidney O. Levinson and Joseph Garrott Allen, a medical panel on "The Use of Sulfonamides in Upper Respiratory Infections" by Brig. Gen. Hugh J. Morgan, M. C., A. U. S., Dr. Italo F. Volini and Dr. William L. Winters, and a clinicopathologic conference conducted by Dr. Edwin F. Hirsch. There will also be a military program, the speakers to be announced later.

INDIANA

Hospital News.—The Welborn-Walker Hospital, Evansville, has been sold to the First Baptist Church. The hospital will be known as the Welborn-Baptist Memorial Hospital.

Personal.—Dr. Clarence A. Hartley Sr. has been appointed health officer of Evansville and Vanderburgh County.——Dr. Onis E. Brendel, Zionsville, has been appointed by Governor Schricker as chairman of the state board of beauty culturist examiners to succeed Dr. Daniel L. Bower, Indianapolis.——Dr. Oscar S. Heller, Greenfield, has resigned as health officer of Hancock County.

Meeting on Social Hygiene.—The Indianapolis Social Hygiene Association and the American Social Hygiene Association will hold a one day conference at the Claypool Hotel, Indianapolis, February 24. Among the speakers will be Drs. Thurman B. Rice, George W. Bowman, Herman G. Morgan, Norman M. Beatty, Arthur F. Weyerbacher and Hugh L. C. Wilkerson, all of Indianapolis.

Outbreak of Typhoid.—An epidemic of typhoid in eight northern Indiana counties was reported, January 28, by the state board of health. Seventy cases were reported in Miami, Kosciusko, Wabash, Huntington, Cass, White, Carroll

and Wells counties. One death occurred in Kosciusko County, February 5. In a statement to the press Dr. Thurman B. Rice, state health commissioner, is reported to have said that "we are pretty certain that it is not water, nor fluid milk, but is probably something packed and hauled into these neighboring counties. It might be cottage cheese or butter or any soft packaged food, or possibly an orange or other soft drink."

KENTUCKY

Changes in Health Officers.—Dr. Samuel L. Andelman has been appointed in charge of the Johnson County Health Department, succeeding Dr. Edward W. Kissel, resigned. Both are of Paintsville.——Dr. William G. Morgan is now director of the Clark County Health Department, Winchester.——Dr. James H. Wells, Pineville, has resigned as health officer of Bell County.

Society News.—Dr. M. Joseph Henry discussed "Intestinal Obstruction" before the Louisville Medico-Chirurgical Society, February 11. Dr. Jesse H. Simpson presented a case report on "Facial Paralysis Following Upper Respiratory Infection." ——The Louisville Society of Medicine was addressed, February 3, by Dr. Richard Alexander Bate on "The Benzene Ring, Induction Current and Colloids in Cancer."——At a meeting of the Transylvania Medical Society, February 3, Dr. George W. Pedigo Jr., Louisville, spoke on "Mode of Action of the Sulfa Drugs and Clinical Evaluation of Sulfamerazine."

NEW HAMPSHIRE

Physiologist Dies.—Colin C. Stewart, Ph.D., Brown professor of physiology at Dartmouth College, Hanover, died January 22, aged 70. Dr. Stewart had been a member of the faculty since 1904. He had been Brown professor since 1908 and had served as secretary of the medical school from 1913 to 1924 and for a year in 1925 was acting dean of the school. He had at one time been on the faculty of Harvard Medical School, Boston, Columbia University College of Physicians and Surgeons, New York, and the University of Pennsylvania School of Medicine, Philadelphia. He was an honorary member of the New Hampshire Medical Society and an associate fellow of the American Medical Association.

NEW YORK

Lecture on Tropical Medicine.—Dr. Barton F. Hauenstein, Buffalo, discussed "Present and Postwar Importance of the Malarias and the Dysenteries" before the Cortland County Medical Society, Cortland, February 18. The lecture is one in a series on tropical medicine sponsored jointly by the state medical society and the state department of health.

Octogenarian Honored.—Dr. Willard T. Rivenburgh was recently honored by the Middleburg Rotary Club in observance of his eightieth birthday. Dr. Rivenburgh has practiced in Middleburg for the past fifty-six years with the exception of a six months period when he served as New York state medical school inspector. According to the state medical journal, he has been coroner of Schoharie County for about twenty-eight years. He has been health officer of the village and town of Middleburg and the towns of Fulton, Blenheim and Gilboa. He once served as president of the Schoharie County Medical Society and as president of the board of education of Middleburg.

New York City

The Duncan Bulkley Lecture.—Dr. George T. Pack presented the annual Duncan Bulkley Lecture of the New York Academy of Medicine, January 21. His subject was "Cancer of the Stomach."

Illegal Practitioner Sentenced.—Henry Horatio Thomas, alias Thamos, who describes himself as a "metaphysician and psychologist," was recently sentenced to six months in the workhouse following his plea of guilty to a charge of unlawfully practicing medicine. In an earlier case Thomas was arrested and found guilty and sentenced to six months in the workhouse. The recent sentence will commence at the termination of the first six months period. Thomas treated by massage and diet. In the earlier prosecution he treated by means of a "spectro-chrome ray machine," which was seized together with other evidence on his first arrest.

Dr. Alfred Meyer Honored.—At a special ceremony, January 27, Mount Sinai Hospital honored Dr. Alfred Meyer, oldest living graduate of its house staff and prominent for his work in tuberculosis. Dr. Meyer, who will observe his ninetieth birthday this year, was presented with a special issue of the *Journal of the Mount Sinai Hospital* containing about thirty-five articles, most of them scientific reports, contributed by his professional associates. Speakers at the ceremony were Leo Arnstein, commissioner of welfare of New York City and president of the Mount Sinai Hospital, Dr. James Alexander Miller and Dr. Ira Cohen, president of the medical board of the hospital. Dr. Meyer was appointed to the Mount Sinai Hospital staff immediately after his graduation at Columbia University College of Physicians and Surgeons in 1877. He subsequently served as a member of the attending staff until 1919, when he retired from active service to become consulting physician.

Annual Report of Long Island College.—Gifts totaling $97,019 were received in the year ended January 1 by the Long Island College of Medicine, Brooklyn, for eight research projects, staff expansion, scholarships, student loans and a new department of psychiatry. The psychiatric development was made possible by a six year grant from the Commonwealth Fund to strengthen the psychiatric phase of education in the medical schools of the country. Contributions of $2,433 were received for an overseas unit, the 79th General Hospital, an all Brooklyn unit now stationed in the European war theater. A grant of $5,000 for scholarships was received from the W. K. Kellogg Foundation, Battle Creek, Mich., to supplement an initial grant of $10,000 to provide loans or scholarships for medical students prior to the adoption of the federal program to put "all able-bodied men in professional schools on an enlisted basis until their training is completed." In the first appeal for communitywide support for the college of medicine a total of $43,432 was received from a group of more than 1,100 contributors. Two endowed scholarships amounting to about $20,000 were established in 1943, the Stanley P. Jadwin and Peter Yudkowsky Memorial Scholarships. A new prize award was established through a gift of $1,000 in memory of Robert R. Benedict, the income from which is to be awarded each year to the fourth year student who offers the best paper on the causes and treatment of any form of psychosis. The Presbyterian Hospital made a contribution of $500 for research on the circulation of blood through the optic nerve, and the Commonwealth Fund continued its three year grant to provide visiting professors under a plan to test the feasibility of more interchange of personnel between medical colleges. The Rockefeller Foundation made a grant of $500 for a series of lectures on problems in the distribution of medical care and the Blatt Memorial Fund was established to endow the quarterly cumulative index in the college's library. The American Medical Association gave $250 for research work in the department of pathology. Commercial medical firms made grants for special studies as follows: E. R. Squibb & Sons, $2,000 for research in lymphogranuloma venereum; the Upjohn Company, $850 to defray expenses incident to clinical investigation of a surgical germicide; the Winthrop Chemical Company, $1,200 for investigations on pneumonia; Lehn and Fink, $2,000 for bacteriology research; the Nepera Chemical Company, $1,200 for research in dimethylsulfadiazine; William R. Warner and Company, Inc., $2,000 for postgraduate study, and the Heliogen Holding Company, $5,150 for heliogen research.

TEXAS

New Professor of Pediatrics.—Dr. Arild E. Hansen, associate professor of pediatrics, University of Minnesota Medical School, Minneapolis, has been appointed as professor of pediatrics and chairman of the department of pediatrics, University of Texas School of Medicine, Galveston, and director of the University of Texas child health program under the auspices of the William Buchanan Foundation of Texarkana. The university's child health program contemplates the further development and expansion of the department of pediatrics to include research and create opportunities for practicing physicians to participate more effectively in promoting child health.

War Conference.—The Texas Hospital Association will sponsor a war conference at the Baker Hotel, Dallas, February 23-24. Among the speakers will be:

Dr. Robert H. Bishop Jr., Cleveland, Blue Cross or Compulsory Health Insurance.
W. S. Brines, chief hospital consultant, War Production Board, Washington, D. C., Procurement of Materials and Supplies.
Dr. Edward H. Cary, Dallas, Plans for Expansion of Group Hospital Service in Texas.
George Bugbee, Chicago, executive secretary, American Hospital Association, Expansion Program of American Hospital Association; Affiliation.
Frank J. Walter, Denver, president, American Hospital Association, Manpower and Womanpower.
Mrs. Dorothy Rogers Williams, R.N., Cleveland, The Director's Dilemma.
Dr. Thomas R. Ponton, Chicago, Medical Staff and Records During and After the War.
Dean Conley, executive secretary, American College of Hospital Administrators, The Hospital Administrator Becomes Professional Conscious.

Proposed Texas Medical Center at Houston.—A proposal has been submitted to set up a Texas Medical Center at Houston to be built on lands made available through the Anderson Foundation in the vicinity of Hermann Hospital. The suggestion was made in a memorandum prepared by Chauncey D. Leake, Ph.D., vice president and dean, University of Texas Medical Branch, Galveston, Frederick C. Elliott, D.D.S., dean, University of Texas School of Dentistry, Houston, Dr. William H. Moursund, dean, Baylor University College of Medicine, Houston, and Dr. Ernst W. Bertner, acting director of the M. D. Anderson Hospital for Cancer Research, Houston. The memorandum, which was submitted to authorities of Baylor and Texas universities, the Anderson Foundation and the Houston Academy of Medicine, recommends the establishment of a committee of representatives from each of the interests involved to coordinate plans for the proposed medical center, the committee to serve as a clearing house for the development of the center. The specific administrative units would include:

The Hermann Hospital and associated hospitals under the auspices of their respective trustees.

A medical school for the training of general practitioners under the auspices of Baylor University.

A college of nursing for the training of registered nurses under the auspices of Baylor University.

A school of dentistry for the training of general practitioners under the auspices of the University of Texas.

The M. D. Anderson Hospital, devoted to cancer research in its broadest aspects but with particular reference to the clinical handling of cancer patients, under the auspices of the University of Texas.

A school of public health (including geographic medicine) for the training of public health officials, for postgraduate and extramural instruction to doctors throughout the state of Texas in the prevention of disease, in the promotion of industrial hygiene and in control of sanitation, under the auspices of the University of Texas.

A central library, auditorium and social center under the auspices of the Houston Academy of Medicine.

GENERAL

Snow Medal Awarded to Dr. Cumming.—The William Freeman Snow Medal was presented on February 1 to Dr. Hugh S. Cumming, Washington, D. C., director of the Pan American Sanitary Bureau and formerly surgeon general of the U. S. Public Health Service, for "outstanding service in the field of social hygiene." Dr. Merritte W. Ireland, formerly surgeon general of the U. S. Army, presented the award during the annual dinner meeting of the American Social Hygiene Association. Dr. Cumming addressed the meeting on "Nations United for Health and Welfare in Peace and War," and Dr. Ray Lyman Wilbur, Stanford University, Calif., president of the association, discussed "The Future of Voluntary Agencies."

Fellows in Aviation Medicine.—The Aero Medical Association of the United States announces that the following have been chosen fellows in aviation medicine:

Dr. Walter M. Boothby, Rochester, Minn.
Comdr. David C. Gaede (MC), U. S. Navy.
Brig. Gen. Malcolm C. Grow, M. C., U. S. Army.
Col. Walter S. Jensen, M. C., U. S. Army.
Dr. Isaac H. Jones, Los Angeles.
Lieut. Comdr. Marion M. Kalez (MC), U. S. Naval Reserve.
Comdr. Wilbur E. Kellum (MC), U. S. Navy.
Dr. William Hodges McKnight, Fort Worth, Texas.
Dr. William R. Stovall, Washington, D. C.

Dr. Harold R. Bohlman, Baltimore, is president of the association, Brig. Gen. Eugen I. G. Reinartz, M. C., U. S. Army, president-elect, and Dr. David S. Brachman, Detroit, secretary-treasurer.

Society News.—The American Broncho-Esophagological Association will hold its annual meeting at the Waldorf-Astoria Hotel, New York, June 6. Dr. Paul H. Holinger, 700 North Michigan Avenue, Chicago, is the secretary.——The twenty-fifth annual meeting of the American Association for Thoracic Surgery, originally scheduled for 1942, will be held at the Drake Hotel, Chicago, May 5-6. Lieut. Col. Richard H. Meade Jr., M. C., A. U. S., Kennedy General Hospital, Memphis 15, Tenn., is the secretary.——The council of the American Association of Pathologists and Bacteriologists has voted that the scientific meeting of the association will not be held in 1944. The council will meet on or about April 8 in Cleveland. Proposals for membership must be in the office of the secretary, Dr. Howard T. Karsner, 2085 Adelbert Road, Cleveland, March 31.——The American Society for Clinical Investigation will hold its annual meeting at the Claridge Hotel, Atlantic City, N. J., May 8.——The Federation of American Societies for Experimental Biology has canceled its 1944 meeting.

Vitamin A Allocations.—On January 28 the War Food Administration announced that in 1944 civilians in the United States will receive 88 trillion U. S. P. units out of about 139 trillion U. S. P. units of the total 1944 vitamin A allocation. While this is about the same quantity that was available for physicians in 1943, the amount is slightly more than 63 per cent of the total allocation for the year. About 5 trillion U. S. P. units will go to the U. S. military and war services. Exports and shipments to our territories, allies and other friendly nations, and a contingency reserve for emergency war purposes required about 46 trillion U. S. P. units, or 33 per cent of the allocable supplies. Allocations represent the planned division of expected supplies of food among the U. S. military and other war services, civilians, American territorial possessions, our allies and liberated areas. Requirements of each group are presented to the Food Requirements and Allocations Committee, the Civilian Requirements Branch of the Office of Distribution, WFA, representing U. S. civilians. Vitamin A has vital civilian food enrichment and pharmaceutical uses, especially for babies. About 40 trillion units of the civilian allocation will go into pharmaceutical preparations, 8 trillion units for food enrichment and the rest for feed enrichment.

Robert Hockett Named Scientific Director of Sugar Research Foundation.—Robert C. Hockett, Ph.D., associate professor of organic chemistry, Massachusetts Institute of Technology, Cambridge, Mass., has been appointed scientific director of the Sugar Research Foundation. According to the *Albany Health Bulletin* the appointment is said to be the first step "in a new and extensive scientific program to extend knowledge of the role of sugar and other carbohydrates in the human body and also of the chemical transformations to which sugars can be subjected. It is anticipated that such chemical studies, both fundamental and applied, will eventually unfold new industrial uses of sugar and its derivatives." Dr. Hockett has been granted a five year leave of absence from the Massachusetts Institute of Technology to carry on his new work with the foundation, which is a nonprofit organization with offices in New York. The foundation, which was organized in June 1943, is supported by cane sugar refiners and beet sugar processors, as well as raw sugar producers of Hawaii, Louisiana and Puerto Rico. It will sponsor research and scientific studies at universities and other research institutions on uses or potential uses of sugar and the dissemination of information uncovered by the research on sugar in its several roles. Dr. Hockett was formerly associate technologist of the National Institute of Health.

Committee on Alcoholism Established by Research Council.—The appointment of a new committee on alcoholism by the Research Council on Problems of Alcohol is one of the results of the recent reorganization of the group. Members of the committee are Drs. Lawrence S. Kubie and Thomas A. C. Rennie, New York, and Mesrop A. Tarumianz, Farnhurst, Del.; Edward H. L. Corwin, Ph.D., New York; Leonard V. Harrison, LL.D., New York, and Francis T. Chambers Jr., Philadelphia, Anna Kempshall, New York, Hunter Miller, Richmond, Herbert Taylor and William Wilson, New York. Under the reorganization the research council aimed to increase its representatives on its board of directors on a regional basis. Thus far some members have been named for the eastern district, Canada, southern district, north central district and the Pacific coast district; however, these appointments are not complete. Another new feature is the appointment of an executive committee of the board of directors to give special attention to the business and financial affairs of the council. An executive committee of seven members of the scientific committee has been appointed to give closer attention to research on the treatment of alcoholism: Dr. Karl M. Bowman, San Francisco; Dr. Frank J. Curran, New York; Lawrence K. Frank, Brooklyn; Dr. Harold E. Himwich, Albany; Elvin M. Jellinek, Sc.D., New Haven, and Thorsten Sellin, Ph.D., Philadelphia.

New Foundation for Scientific Research.—Establishment of the Passano Foundation, Inc., has been announced by the Williams & Wilkins Company, Baltimore, "for scientific and educational purposes, particularly to provide for scientific research and to publish the results of scientific research and to make awards for meritorious achievements in scientific research." The foundation is named for Mr. Edward B. Passano, chairman of the board of the Williams & Wilkins Company, who has actively been identified with the development of scientific publishing for a period of more than thirty-five years. By the terms of the charter of the foundation, the board of directors may inaugurate the establishment of an annual award not to exceed $5,000 for the outstanding contribution to the advancement of medical science made within the year by an American citizen. A number of other projects are under consideration, one of which is the advancement of postgraduate instruction among physicians in sections of the country not accessible to medical centers in the larger cities. Mr. Robert S. Gill, president of the Williams & Wilkins Company, has been elected president of the new foundation, which will have its headquarters at Mount

Royal and Guilford avenues, Baltimore 2. Members of the board of directors include Dr. Emil Novak, associate professor of obstetrics, Johns Hopkins University School of Medicine, Dr. George W. Corner, director of the Embryological Laboratory of the Carnegie Institution of Washington, and Mr. Geo[illegible] Hart Rowe of the Williams & Wilkins Company, all of Ba[illegible]e.

Government Services

Public Health Service Releases Annual Report

The provisional general mortality figure for the first six months of 1943 was 11.0 per thousand of population in the United States, about 3.8 per cent higher than for the corresponding period in 1942, according to the annual report of Surg. Gen. Thomas Parran of the U. S. Public Health Service. The provisional general death rate of 10.4 per thousand of population for the year 1942 was the lowest on record, as also were provisional infant and maternal mortality rates of 40.8 and 2.7 respectively per thousand live births. The mortality from all accidents in 1942 was 68.8 per hundred thousand of population, or approximately 7 per cent lower than in 1941, and the rate for automobile accidents in 1942 was 20.1 per hundred thousand of population, or about 30 per cent less than in 1941. Lower provisional mortality rates were recorded in 1942 for typhoid and paratyphoid, pneumonia, diarrhea and enteritis under 2 years, diphtheria, scarlet fever, whooping cough, tuberculosis, measles, encephalitis and poliomyelitis. Diseases of adult life and old age (cancer, cerebral hemorrhage, diabetes and heart disease) had higher mortality rates. Early in 1943 meningococcic meningitis became epidemic, with an incidence 1.9 times higher for 1942 than the five year median (1937-1941). By the week ended July 21, 1943 12,482 cases had been reported, the largest number since 1914. Poliomyelitis, although below the median expectancy in 1942, became epidemic early in 1943. Incomplete information on diseases in foreign countries indicated increases in quarantinable diseases, especially typhus, in Algeria, Egypt, Morocco, Rumania and Tunisia. A decrease of typhus in Spain was reported. Twice as many cholera cases occurred in China in 1942 as in 1941. Plague and smallpox increased in the majority of countries reporting these diseases. Fourteen countries reported yellow fever in 1942, sixteen in 1941. Bolivia had the highest incidence, with 94 cases and 15 deaths.

GENERAL PUBLIC HEALTH PROGRAM

Total appropriations for the U. S. Public Health Service in the fiscal year 1943 amounted to $47,037,245. The amount available for grants-in-aid to the states under title VI of the Social Security Act was $11,000,000. The emergency health and sanitation appropriation was $9,702,200, and $12,367,000 was appropriated for venereal disease control.

The total amount of funds budgeted from all sources in the cooperative federal-state-local public health program in the forty-eight states, two territories, Puerto Rico, the Virgin Islands and the District of Columbia during 1943 was $125,200,874.13, or 5.35 per cent more than the amount budgeted during 1942. The combined federal, state, local and other funds spent for venereal disease control during 1943 was $19,368,458. State and local funds increased by $472,500 over the previous year, totaling $7,457,100. Funds provided by state and local sources increased from 3.2 cents per capita in 1939 to 5.6 cents in 1943. A total of $21,221,874 was appropriated for the fiscal year for general public health work in the states. This sum included funds for emergency health and sanitation programs, grants-in-aid to state health departments and the prevention of the spread of communicable diseases. The reported increase of funds budgeted by state and local authorities represents an addition of local communities which had not previously reported their budgets to the Public Health Service. In spite of the establishment of new units in war areas, the progress in the expansion of health facilities noted in previous years was not sustained in 1943. Personnel shortages caused the amalgamation of separate local units and the expansion of district units to include more territory. Although the number of counties having some form of full time health service was not reduced substantially, service was spread thinner than in previous years.

Construction of Health Facilities.—Progress in construction of 451 Community Facilities Act health projects approved by President Roosevelt was slow because of material shortages. By July 31, 1943, however, forty-two hospital projects (providing 2,567 beds) and fifty-nine health center projects had been completed; eighty-six hospital projects (providing 7,574 beds) and sixteen health center projects were under construction.

Malaria Control.—Malaria control activities included drainage operations and larviciding in areas contiguous to 1,161 military, naval and war industry establishments in eighteen states, the District of Columbia and Puerto Rico. Densities of malaria mosquitoes were reduced in and near 92 per cent of the war establishments where control measures were undertaken. Aedes aegypti control programs for yellow fever were carried on successfully at Charleston, S. C., and in Miami and Key West, Fla.

Tuberculosis.—In tuberculosis control, chest examinations were given to 320,000 workers in eighty-five war establishments in eleven states and the District of Columbia, and 60,000 migratory workers were examined before entering the United States from Mexico. A routine chest x-ray examination of all Coast Guard and Merchant Marine recruits was undertaken. Study was made of the reporting and follow-up procedures used in each state in regard to men rejected for military service, but only twenty-five states and the District of Columbia established satisfactory follow-up systems.

VENEREAL DISEASE CONTROL

Civilian and military venereal disease control programs prevented an increase in syphilis and gonorrhea among soldiers, sailors and war workers.

A noteworthy achievement of the year was the establishment of a network of rapid treatment centers where experimental studies are carried on to determine which of the intensive syphilis treatment schedules are most effective.

RESEARCH

Results of the many investigations undertaken by the National Institute of Health at the request of the Army, the Navy and other war agencies are being withheld from general circulation until after the war, because of their military significance. Among the achievements of 1943 was the discovery of the virus of a new human disease of the atypical pneumonia group. Another was the discovery of the curative action of isotonic solution of sodium chloride administered by mouth in various forms of shock. A study of the epidemiology of trichinosis leading to demonstration of the widespread prevalence of this infection in the United States and proposals for its control was completed. A contribution was made to our knowledge of dysentery, including incidence, carriers, diagnosis, treatment and control among troops. The first transformation was made of normal mammalian cells, grown in test tubes and isolated from the living organism, into cancer cells that would invade and kill animals of the same strain from which the cells originally came. Other studies were made of carcinogenesis, the characteristics of tumor tissue and tumor growth. Forty-nine hospitals had loans of radium from the National Cancer Institute at the beginning of the fiscal year.

The provision of medical care in marine hospitals showed a moderate increase in the total number of patient days of relief furnished and an increase in the number of admissions and discharges. Most of the beneficiaries were members of the American Merchant Marine and the U. S. Coast Guard. The expansion of the Coast Guard and the number of alien detention stations created additional demands for service.

Continuous caudal analgesia in obstetrics, developed by two members of the staff at the Staten Island Marine Hospital, received wide recognition as a distinct contribution to the practice of obstetrics. Most of the drug addict population of the Fort Worth (Texas) hospital was transferred to the hospital at Lexington, Ky. At the Fort Worth hospital the treatment of psychotic patients increased under the provisions of Executive Order 9079.

FOREIGN QUARANTINE

Because of the constantly increasing number of airplanes arriving in Washington, D. C., from Africa after a lapse of only thirty-six hours, a quarantine station was established in that city to protect the community from epidemic diseases common in Africa.

OTHER HIGHLIGHTS

The establishment of blood plasma banks in civilian hospitals has become an important nationwide service. At the close of the fiscal year (June 1943) 158,290 units of plasma was available in hospitals and reserve depots in the United States, Alaska and Puerto Rico.

The Public Health Service district office at San Francisco assumed responsibility for the medical care of all Japanese evacuees from Hawaii from the time their ships docked at San Francisco until they were turned over to war relocation authorities. Evacuees from the Orient and Europe arriving at New York were furnished with medical and hospital care.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 15, 1944.

Results in the Treatment of War Wounded

The excellent arrangements for the prompt evacuation and treatment of the wounded in the war have been described in previous letters to THE JOURNAL. It is now possible to give collected statistics. An analysis of 30,000 battle casualties admitted to Middle East hospitals during the year ended March 31, 1943, is now available. It shows a mortality of only 2.1 per cent, compared to 7.44 per cent in the hospitals of Egypt and Palestine during the first world war. The total of deaths in hospitals was 611. It is considered that under the conditions of the last war over 1,500 more patients would have died.

Army medical authorities attribute this remarkable improvement to three main causes: 1. Patients are brought to hospitals in better condition and more rapidly than during the last war. This is accomplished by provision of mobile operating theaters working close to the front line. 2. There are better facilities for blood transfusions. 3. The sulfonamides are universally used. Additional factors are the improved technics, training of army medical orderlies and the use of air ambulances.

A National War Formulary

The war has produced a great shortage of many drugs obtained from the large part of the world which is occupied by the enemy. As in the case of food, the fighting services have priority over civilians, and many drugs, such as quinine, are unobtainable for ordinary use. Among the drugs difficult to supply are catechu and colchicum. To relieve the catechu shortage a chalk mixture containing no catechu is listed in the National War Formulary. Physicians are told that it would be much appreciated if they would consider whether or not this product would suffice before they order chalk mixture with catechu. To relieve the colchicum shortage a tablet of colchicine is listed. This can be used when pharmacists are unable to dispense one of the two official mixtures containing colchicum, but physicians are asked not to order colchicine unless it is considered absolutely necessary.

War conditions render imperative the strictest economy in prescribing drugs. Even if the drugs are available their packing and distribution, often under difficult conditions, make demands on materials, manpower and transportation which can be justified only if the drugs are required for essential medical purposes. Agar is reserved for bacteriologic purposes and should not be prescribed. Bismuth salts should be reserved for the treatment of syphilis and tropical diseases. The prescribing of cinchona products and their synthetic substitutes is prohibited except for the treatment of malaria. Quinidine may be used only for the treatment of cardiac arrhythmia.

Transfusion of the Wounded in Ambulances

The *Army Medical Department Bulletin* reports that in the African campaign many wounded men successfully resuscitated by transfusion in forward medical units collapsed during evacuation. This meant a second resuscitation, which appeared to be neither as rapid nor as complete as the first. To meet this difficulty great resourcefulness and ingenuity were shown in devising means of continuing transfusion during the journey in ambulances and other means of transport. The results of these "traveling transfusions" were highly satisfactory. Between August 1942 and May 1943 they were given to 200 men, and no patient was traced who, with the transfusion in progress, arrived in a state of shock. The blood pressure was maintained for the whole journey at the initial level, and the systolic pressure of 2 patients had risen by 10. To supervise the transfusion it was necessary for a medical orderly to travel with the patient. If the journey was long, a spare bottle of blood or plasma was sent to enable the transfusion to be continued.

In an ambulance the transfusion is set up in the normal manner with special attention to details. The splinting of the arm must include a firm bandage across the palm to prevent any pronation of the forearm, which would lead to flexion at the elbow and displacement of the needle. The needle must be placed truly into the lumen of the vein for ½ inch. When the set runs satisfactorily the needle union and the surrounding skin are fixed by elastoplast. It is rarely necessary to employ a cannula even in the worst cases of shock. It is important not to fix the arm in a straight splint, for this produces discomfort from hyperextension. For providing rigidity a Cramer wire is bent to an angle of 10 degrees in the middle and enclosed in a plaster slab. The stretcher is placed on the lower bunk on the side, which permits the patient's transfusion arm to be on the inboard side of the stretcher. The orderly carrying the bottle ties the suspender to the forward ventilator in the roof of the ambulance with an 18 inch piece of bandage. Three lengths, tied to the neck of the bottle, are used as stays.

John Swift Joly

The death of John Swift Joly at the age of 67 years has removed one of Great Britain's leading genitourinary surgeons. He was a member of an Irish family distinguished in science and was a descendant of the satirist Dean Swift. His elder brother was astronomer royal in Dublin, and his cousin John Joly, F.R.S., invented the bomb calorimeter and was a pioneer in color photography. After a distinguished university career in science, Joly turned to medicine. He was qualified to practice in 1902 after a brilliant career as a student and then became house surgeon at Sir Patrick Dun's Hospital. He next went abroad with a surgical traveling scholarship to work under Kocher at Berne and in the Vienna clinics. He returned to London and was appointed house surgeon at the Lock Hospital and later at St. Peter's Hospital for Stone. His appointment to the staff of the latter marked the beginning of his career as a specialist. He was a genitourinary surgeon with a wide scientific outlook; he did not write much in the journals, but his work was distinguished by high quality. He embodied his profound knowledge of one subject in his book "Stone and Calculous Disease of the Urinary Organs," which has an international reputation. He was keenly interested in foreign work and was not only a member of the various urologic societies but for a time English secretary of the International Association of Urologists. His loss is mourned by colleagues, patients and friends not only for his knowledge but also for his geniality and great courtesy.

Marriages

WILLIAM ROBERT SCHAFFARZICK, White Sulphur Springs, Mont., to Miss Margaret King of Tuscaloosa, Ala., in Atlanta, Ga., December 29.

WILLIAM JEFFRESS SENTER, Chalybeate Springs, N. C., to Miss Bettye Faye Ashcraft of Mobile, Ala., December 30.

THOMAS H. BREWER JR., Columbus, Ga., to Miss Betty Lopez of Hartford, Conn., in Chicago December 31.

PAUL M. SCOTT, Cozad, Neb., to Miss Janice Sandall of Rock Island, Ill., in Bassett, Neb., December 23.

ANDREW JOSEPH SELLETT, La Salle, Ill., to Miss Betty Lou Peters of Nokomis in Evanston December 18.

Deaths

Albert Edwin Larkin ✠ Syracuse, N. Y.; Syracuse University College of Medicine, 1897; since 1933 professor emeritus of clinical medicine at his alma mater, where he had been professor from 1911 to 1933, associate professor from 1908 to 1911 and lecturer in clinical medicine from 1906 to 1908; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; for many years on the staff of the Syracuse Memorial Hospital and St. Joseph Hospital; member of the board of trustees of Syracuse University from 1921 to 1933; died November 2, aged 71, of generalized arteriosclerosis and macrocytic anemia.

Theodore Carl Hempelmann ✠ St. Louis; Washington University School of Medicine, St. Louis, 1908; associate professor of clinical pediatrics at his alma mater; member of the American Pediatric Society and the American Academy of Pediatrics; specialist certified by the American Board of Pediatrics, Inc.; served as a member of the advisory committee, city health department; consultant pediatrician, St. Louis Children's Hospital, St. Luke's Hospital and St. Louis Maternity Hospital; pediatrician, City Isolation Hospital and the Shriners' Hospital for Crippled Children; died in University City, December 13, aged 58, of coronary thrombosis.

Thomas Clarence Johnson ✠ Lumberton, N. C.; University College of Medicine, Richmond, 1903; past president of the Robeson County Medical Society, which in 1939 presented him with a gold watch in recognition of his outstanding service as physician and surgeon; served as president of the Fifth District Medical Society; fellow of the American College of Surgeons; in 1937 an oil portrait of him was presented by his friends in the community to the Thompson Memorial Hospital, where he had been chief of staff and chief surgeon; the portrait was hung in the Johnson House, a nurses' home named for him; died at the hospital December 31, aged 64, of acute myocardial failure with coronary thrombosis.

John A. Fell, Doylestown, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1874; member of the Medical Society of the State of Pennsylvania; served as a member of the school board and board of health of Doylestown; at one time served as assistant surgeon of the Sixth Regiment of the Pennsylvania National Guard; in 1933 the state medical society paid tribute to him in recognition of his "fifty-nine years of medical service faithfully performed to his community in the traditional ideals of the medical profession"; the oldest alumnus of the University of Pennsylvania School of Medicine; died January 4, aged 93.

James Thomas Sweetman, Ballston Spa, N. Y.; Howard University College of Medicine, Washington, D. C., 1886; formerly secretary of the Saratoga County Medical Society; a founder and honorary chairman of the Saratoga County Tuberculosis Association; a member of the board of managers and on the staff of the Saratoga County Tuberculosis Hospital (Homestead Sanatorium), Middle Grove; served as vice president and director of the Ballston Spa National Bank; a director of Boy Scout work in Saratoga County; died December 13, aged 81.

George Sidney Britten, DeFuniak Springs, Fla.; Syracuse (N. Y.) University College of Medicine, 1900; professor emeritus of otolaryngology at his alma mater; member of the Medical Society of the State of New York; specialist certified by the American Board of Otolaryngology; served in the medical corps, American Expeditionary Forces, during World War I; for many years on the staff of the Hospital of the Good Shepherd, Syracuse University; died in a Pensacola hospital December 27, aged 69, of hemorrhage due to gastric ulcer.

Anders Einar Johnson, Watertown, S. D.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1903; member of the South Dakota State Medical Association and the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; served as president of the South Dakota Academy of Ophthalmology and Otolaryngology; health officer of Codington County from 1932 to 1935; a member of the staff of the Luther Hospital; died December 30, aged 72, of sarcoma of the left lung.

William B. Beaumont, Laceyville, Pa.; College of Physicians and Surgeons, Baltimore, 1891; member of the Medical Society of the State of Pennsylvania; head of the local board of health and surgeon for the Lehigh Valley Railroad for many years; county examiner for the Pennsylvania Bureau of Pensions for the Blind; died in Wyalusing December 22, aged 78.

Adville Crosswell Baskin, Bishopville, S. C.; Vanderbilt University School of Medicine, Nashville, Tenn., 1899; president of the People's Bank; died in Tuomey Hospital, Sumter, December 31, aged 72, of neoplasm of the brain.

Bertram Robert Beers, Evanston, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; member of the Illinois State Medical Society; served during World War I; died January 4, aged 61, of acute nephritis and diabetes mellitus.

Thomas A. Boaz, Stoneville, N. C.; College of Physicians and Surgeons of Baltimore, 1892; died in the City Hospital, Winston-Salem, January 3, aged 76, of uremia.

Ralph Earle Brodie ✠ Albion, N. Y.; Cornell University Medical College, New York, 1904; served as coroner of Orleans County and health officer of the village of Albion and the town of Barre; served during World War I; died in the Arnold Gregory Memorial Hospital January 9, aged 65, of chronic myocarditis and chronic nephritis.

Walter Herman Buhlig ✠ Chicago; Northwestern University Medical School, Chicago, 1903; president of the Englewood Branch of the Chicago Medical Society, 1916-1917; served during World War I; senior medical chief of attending staff, Evangelical Hospital; died January 15, aged 67, of decompensation of the heart due to arteriosclerosis and bronchial asthma.

Edwin Holmes Douglas, Petroleum, W. Va.; Bellevue Hospital Medical College, New York, 1894; member of the West Virginia State Medical Association; on the emeritus staff, St. Joseph's Hospital, Parkersburg; died December 28, aged 76, of pernicious anemia.

Henry Stover Foltz, Philadelphia; University and Bellevue Hospital Medical College, New York, 1900; served on the staffs of the Cortland County Hospital, Cortland, N. Y., Newcomb Hospital, Vineland, N. J., and the Royal Pines Hospital, Pinewald, N. J.; died in Barnegat Pines, N. J., December 23, aged 76, of burns received when an oil stove exploded.

Joseph Herbert Augustus Foster, Cornell, Wis.; Trinity Medical College, Toronto, Ont., Canada, 1901; member of the State Medical Society of Wisconsin; on the staff of St. Joseph's Hospital, Chippewa Falls; died suddenly January 1, aged 69, of heart disease.

Jesse Franklin Gamble, Lincolnton, N. C.; University of Tennessee Medical Department, Nashville, 1903; served as a member of the board of aldermen; member of the staff of the Reeves Gamble Hospital; died December 24, aged 65, of cerebral hemorrhage.

Earl M. Gilliam, Columbus, Ohio; Starling Medical College, Columbus, 1888; formerly professor of gynecology at the Ohio State University College of Medicine and associate professor of gynecology at his alma mater; past president of the Columbus Academy of Medicine; formerly chief of staff, St. Anthony Hospital, where he died December 21, aged 76, of cerebral hemorrhage.

Albert Thomas Grills, Lorain, Ohio; Western Reserve University Medical Department, Cleveland, 1904; served on the staff of St. Joseph's Hospital; died December 19, aged 65, of heart disease.

Cornelius Gunderson, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1904; member of the Illinois State Medical Society; on the staff of the Norwegian-American Hospital; died January 17, aged 70, of carcinoma of the transverse colon with metastases.

Andrew Wade Haden, Summit, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1882; died December 27, aged 89, of chronic nephritis.

Miller Craft Henry, Georgetown, Miss.; Medical Department of Tulane University of Louisiana, New Orleans, 1908; member of the Mississippi State Medical Association; died in Sanatorium January 8, aged 60, following a pneumonectomy.

James Esmond Hereford, Morgantown, W. Va.; Leonard Medical School, Raleigh, N. C., 1913; died December 15, aged 60, of acute coronary heart disease.

Thomas Francis Higgins, Toledo, Ohio; Milwaukee Medical College, 1912; member of the Ohio State Medical Association; served in the medical corps of the U. S. Army during World War I; formerly superintendent of the Lucas County General Hospital and Lucas County Hospital Annex; on the staffs of the Mercy Hospital and St. Vincent's Hospital, where he died December 16, aged 55, of cardiac collapse following an operation.

Roy Albert Hill, Thomasville, Ga.; Emory University School of Medicine, Atlanta, 1915; fellow of the American College of Physicians; member of the Medical Association of Georgia; served during World War I; on the staff of the John D. Archbold Memorial Hospital; died January 1, aged 54, of coronary thrombosis.

William O. Holloway, Chappells, S. C.; University of Maryland School of Medicine, Baltimore, 1899; member of the South Carolina Medical Association; alderman; died in the Greenwood Hospital, Greenwood, December 28, aged 69, of coronary thrombosis.

Charles L. Hope, Oak Ridge, La.; Memphis (Tenn.) Hospital Medical College, 1894; died December 14, aged 81, of coronary occlusion.

Harry Dresser B. Howe ✠ Hampton, Va.; University of Pennsylvania Department of Medicine, Philadelphia, 1895; fellow of the American College of Surgeons; served during World War I; member of the Selective Service Board; for many years on the staff of the Elizabeth Buxton Hospital, Newport News, Veterans Administration Facility, Kecoughton, and the Dixie Hospital; a charter member of the Hampton Rotary Club; died December 27, aged 71, of cerebral hemorrhage and hypertension.

Herbert Waldo Hoyt, Santa Barbara, Calif.; Boston University School of Medicine, 1891; formerly on the staff of the Genesee Hospital, Rochester, N. Y.; died December 30, aged 80, of carcinoma of the stomach.

John Jay Hunt, Bayonne, N. J.; Columbia University College of Physicians and Surgeons, New York, 1908; died January 4, aged 66, of illuminating gas poisoning, a narcotic self administered and a self inflicted bullet wound.

Clarence William Kash, Carlisle, Ky.; Kentucky School of Medicine, Louisville, 1906; served during World War I; died in the Veterans Administration Facility, Dayton, Ohio, December 30, aged 59, of coronary sclerosis.

Robert Mayer Laemle ✠ Chicago; Rush Medical College, Chicago, 1935; surgical pathologist, Michael Reese Hospital; served as instructor in obstetrics and gynecology at the University of Illinois College of Medicine; associate obstetrician, Chicago Maternity Center; died December 31, aged 39.

Daniel Joseph Langton ✠ Philadelphia; Jefferson Medical College of Philadelphia, 1917; also a pharmacist; served during World War I; on the staffs of the Fitzgerald-Mercy Hospital, Darby, and the Jefferson Medical College Hospital and Misericordia Hospital; died December 27, aged 56, of coronary thrombosis.

Walter Eber Leonard, Los Angeles; Rush Medical College, Chicago, 1916; died January 3, aged 53.

Russell Walter Lowe ✠ Ridgefield, Conn.; University of the City of New York Medical Department, New York, 1889; served in the medical corps of the U. S. Army and as chief medical examiner for the Twelfth Connecticut Selective Service District during World War I; formerly health officer; on the staff of the Danbury Hospital, Danbury; died January 3, aged 75, of arteriosclerosis and cerebral hemorrhage.

Mars Laurice Madsen, Canova, S. D.; Rush Medical College, Chicago, 1926; member of the South Dakota State Medical Association; died January 8, aged 45.

Amos A. Martin, Kokomo, Ind.; Medical College of Indiana, Indianapolis, 1896; died in an Indianapolis hospital December 14, aged 79, of chronic myocarditis and chronic rheumatism.

Royse Wood Martin, Las Vegas, Nev.; University Medical College of Kansas City, Mo., 1903; formerly a member of the state legislature; served as president of the Las Vegas Hospital Association; for many years chief surgeon for the Las Vegas and Tonopah Railroad; a charter member of the chamber of commerce and Rotary Club and former president of both; on the staff of the Basic Magnesium Hospital, where he died December 22, aged 69.

Joseph K. McCance, Pittsburgh; University of Pennsylvania Department of Medicine, Philadelphia, 1881; died December 30, aged 86, of general arteriosclerosis.

George McClintock, Overbrook, Kan.; College of Physicians and Surgeons, Medical Department of Kansas City University, Kansas City, 1899; member of the Kansas Medical Society; died December 27, aged 71.

Ardsley H. McLaughlin, Aurora, Ill.; Eclectic Medical Institute, Cincinnati, 1890; member of the staff of the Copley Hospital, where he died January 13, aged 75.

John W. Millette ✠ Dayton, Ohio; Ohio Medical University, Columbus, 1903; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; specialist certified by the American Board of Otolaryngology; for many years on the staffs of the Veterans Administration Facility, National Military Home, and St. Elizabeth Hospital, where he died December 28, aged 79, of cirrhosis of the liver and myocarditis.

James Warren Milligan, North Madison, Ind.; Rush Medical College, Chicago, 1889; member of the Indiana State Medical Association and the American Psychiatric Association; since 1915 medical superintendent of the Madison State Hospital; formerly physician in charge of the Indiana State Prison Hospital, Michigan City; member of the Rotary Club; died in the Methodist Hospital, Indianapolis, January 5, aged 84, of respiratory failure following an operation for stones in the bladder.

John Gray Morris, Geneseo, N. Y.; University of Buffalo School of Medicine, 1904; served during World War I; for many years health officer; died December 21, aged 70, of cerebral hemorrhage.

Thomas H. Murphy ✠ Pawtucket, R. I.; University and Bellevue Hospital Medical College, New York, 1899; at one time a lieutenant (jg) in the U. S. Navy; formerly chairman of the school committee; consulting surgeon, St. Joseph Hospital, Providence; died in December, aged 71, of pneumonia.

Raymond G. Olson ✠ Muskegon Heights, Mich.; Jenner Medical College, Chicago, 1900; formerly city health officer and president of the board of education; on the staffs of the Mercy Hospital and the Hackley Hospital, Muskegon, where he died December 25, aged 72, of pneumonia and myocarditis.

Robert Carpenter Panter ✠ Dorchester, Neb.; University of Nebraska College of Medicine, Omaha, 1904; served in the medical corps of the U. S. Army during World War I; on the nonresident staffs of St. Elizabeth, Lincoln General and Bryan Memorial hospitals, Lincoln; died December 10, aged 61, of carcinoma of the pancreas.

William Edward Patterson, Tempe, Ariz.; Arkansas Industrial University Medical Department, Little Rock, 1884; died in St. Joseph Hospital, Phoenix, December 10, aged 82, of cardiorenal vascular disease.

Oscar Legier Perkins, Clarksdale, Mo.; Northwestern Medical College, St. Joseph, 1892; De Kalb County physician; served during World War I; at one time postmaster of Union Star; a member of the school board; formerly a medical officer for the Civilian Conservation Corps at Ely, Minn.; died in a St. Joseph hospital December 15, aged 76.

Louis William Pijan, Warm Springs, Ore.; Jenner Medical College, Chicago, 1906; served during World War I; since 1929 physician for the Indian Service; died suddenly December 28, aged 62, of heart disease.

Woolsey B. Potter, Bayside, N. Y.; Medico-Chirurgical College of Philadelphia, 1902; died December 15, aged 68.

Laurence Rutherford Quilliam, Seattle; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1908; member of the Washington State Medical Association; served in the medical corps of the U. S. Army during World War I; associated with the Veterans Administration; died in Dearborn, Mich., December 22, aged 63, of carcinoma of the intestine.

Spence Redman ✠ Platte City, Mo.; Jefferson Medical College of Philadelphia, 1883; an organizer of the Platte County Medical Society and served as its president, secretary and treasurer; had been secretary of the society consecutively since 1923 and for many years councilor of the twelfth district; died December 21, aged 81.

Homer Reese ✠ Gallatin, Tenn.; Vanderbilt University School of Medicine, Nashville, 1901; past president and secretary of the Sumner County Medical Society; served as a major in the medical corps of the U. S. Army during World War I; died January 1, aged 68, of cardiac asthma.

John T. Robertson, Cabool, Mo.; Kansas City Medical College, 1894; member of the Missouri State Medical Association; died November 27, aged 76.

Edwin M. Rodenberger, Macedon, N. Y.; Homeopathic Medical College, Cleveland, 1885; chairman of the water system board; died December 19, aged 83, of myocarditis and spastic paraplegia.

Sherwood Dwight Sawyer, Hilton, N. Y., Baltimore Medical College, 1908; member of the Medical Society of the State of New York; health officer of Hilton; died in the Strong Memorial Hospital, Rochester, January 11, aged 65, of congestive heart disease.

Albert Theodore Schmidt, Wilkinsburg, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1908; died December 26, aged 60, of chronic myocarditis.

William Jasper Shelton ✠ Mayfield, Ky.; Kentucky School of Medicine, Louisville, 1902; on the staffs of the Mayfield and Fuller-Gilliam hospitals; instantly killed December 24, aged 71, in an automobile accident.

Lucy M. Shepherd, New York; the Hahnemann Medical College and Hospital, Chicago, 1894; died in Bayside, N. Y., December 12, aged 79.

Morris Abraham Silberg, Boston; Tufts College Medical School, Boston, 1920; member of the Massachusetts Medical Society; died November 20, aged 50.

Jay Claude Simmons, Canton, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1906; formerly a deputy coroner; a past president of the Rotary Club of Canton and the board of education; on the staff of the Graham Hospital; died December 22, aged 65, of coronary thrombosis.

Ferdinand Stabel, Redding, Calif.; Cooper Medical College, San Francisco, 1896; formerly county physician and health officer; died December 8, aged 72, of bilateral pneumonia and uremia.

Frederick Parks Steck ✠ Shamokin, Pa.; Medico-Chirurgical College of Philadelphia, 1908; formerly county coroner; died December 23, aged 75, of heart disease.

Haskell B. Rosenblum, P. A. S., U. S. P. H. S., 1911-1943

Ora Leonidas Stephenson, Indianapolis; Medical College of Indiana, Indianapolis, 1891; died in St. Vincent's Hospital December 17, aged 78.

Jacob James Stotter, New York; Medizinische Fakultät der Universität Wien, Austria, 1890; died in Miami Beach, Fla., December 29, aged 80.

Gustavus E. Stromberg, Langdon, N. D.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1909; coroner and health officer of Cavalier County and health officer of Langdon for many years; served as secretary of the staff and chief, Mercy Hospital; died December 21, aged 59, of coronary occlusion.

Albert Ernest Stuht, Seattle; John A. Creighton Medical College, Omaha, 1896; for many years director of health and chairman, Washington State Board of Health; formerly associated with the U. S. Public Health Service; served as physician and health officer of Spokane County; at one time resident director of the Edgecliff Sanatorium, Spokane; served as a medical officer for the American Mail Line; died in the U. S. Marine Hospital December 25, aged 72, of pneumonia, following influenza.

Orlando G. Taylor, Palestine, Ill.; College of Physicians and Surgeons of Chicago, 1893; member of the Illinois State Medical Society; district surgeon for the Illinois Central Railway; died December 30, aged 80, of myocarditis.

Edward Reed Wagner, Claremont, Calif.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1887; at one time a medical missionary in China; served as director of the San Jose Y. M. C. A.; on the staffs of the San Jose Hospital and the Santa Clara County Hospital, San Jose; died in the Pomona Valley Community Hospital, Pomona, December 16, aged 81, of coronary infarct.

Theron Otis Walker, Greer, S. C.; Medical College of the State of South Carolina, Charleston, 1914; served in the medical corps of the U. S. Army during World War I; for many years a member of the board of education; on the staff of the Spartanburg General Hospital, Spartanburg, Greenville General Hospital and St. Francis Hospital, Greenville; died December 27, aged 52, of myocardial failure following cerebral embolism.

Harold Graves Waller, Ann Arbor, Mich.; University of Michigan Medical School, Ann Arbor, 1920; instructor, department of internal medicine, at his alma mater; resident on the staff of the University Hospital; died December 26, aged 48.

Thomas M. Walsh ✠ Hasbrouck Heights, N. J.; Maryland Medical College, Baltimore, 1903; on the staff of the Hackensack Hospital, Hackensack; surgeon for the police and fire departments; died December 21, aged 62, of cardiovascular renal disease.

William Wilbur Warne, Brownsville, Pa.; Jefferson Medical College of Philadelphia, 1889; died in Kingston, N. Y., December 24, aged 81, of chronic myocarditis.

Louis Roy Wayman, Murphysboro, Ill.; St. Louis College of Physicians and Surgeons, 1909; member of the Illinois State Medical Society; on the staff of St. Andrew's Hospital, where he died December 20, aged 63, of hypertension, arteriosclerosis and nephritis.

James F. Webb, Decatur, Ga.; Atlanta Medical College, 1869; Civil War veteran; died December 28, aged 95, of chronic heart disease.

Edward Herman Wehle, Milwaukee; Milwaukee Medical College, 1898; also a pharmacist; died at his home in Pewaukee December 24, aged 69, of cardiac embolism.

Capt. George A. Wildmann M. C., A. U. S., 1913-1943

Ellis Bruce Wenner, Philadelphia; Medico-Chirurgical College of Philadelphia, 1891; died in the Delaware County Hospital, Drexel Hill, Pa., December 31, aged 76, of heart disease.

David White, Tobinsport, Ind.; University of Louisville (Ky.) Medical Department, 1890; died December 26, aged 77, of pneumonia.

Sara C. Wilcox, Denver; Colorado School of Medicine, Boulder, 1897; member of the Colorado State Medical Society; on the staff of the Children's Hospital; died in Santa Barbara, Calif., December 23, aged 76, of pneumonia.

Bernice A. Zeigler ✠ Shamrock, Texas; Memphis (Tenn.) Hospital Medical College, 1901; city health officer; on the staff of St. Mary's Hospital; died December 23, aged 70, of lobar pneumonia.

KILLED IN ACTION

Haskell Benjamin Rosenblum ✠ Passed Assistant Surgeon, U. S. Public Health Service, Newton Center, Mass.; Cornell University Medical College, New York, 1938; commissioned assistant surgeon in the U. S. Public Health Service Reserve; assigned to National Training School for Boys, Washington, D. C., Nov. 6, 1939 and commissioned in the regular corps; assigned to the Marine Hospital, Ellis Island, N. Y., Jan. 2, 1940; assigned as chief medical officer at the National Training School for Boys on June 29, 1940, and as chief medical officer aboard Coast Guard Cutter Muskeget, June 28, 1942; promoted to grade of passed assistant surgeon in the regular corps on Aug. 16, 1942; aged 32; reported missing in action Sept. 9, 1942 after the Muskeget was lost at sea; reported dead Oct. 14, 1943 by the U. S. Public Health Service.

George Alexander Wildmann, Trenton, N. J.; Jefferson Medical College of Philadelphia, 1938; member of the Medical Society of New Jersey; captain, medical corps, Army of the United States; awarded the Purple Heart Medal for meritorious work; killed in action in the North African area October 7, aged 30.

Correspondence

STANDARDIZATION OF BIBLIOGRAPHIC REFERENCES

To the Editor:—You have frequently been the recipient of many excellent suggestions intended for general improvement of the medical and allied professions. Recently the recommendation to advocate universal adoption of the metric system in lieu of the apothecary system was given prominence and justifiably so. Can you listen to another?

All too frequently authors of proposed publications in the medical sciences are confronted with varying whims and idiosyncrasies of editorial board members in relation not only to structure, content and style of presentation but in particular to one feature of a manuscript which should by all measures of practicability and convenience be uniform, namely the bibliographic notations. Your organization has made a real contribution in the direction of standardization in this situation, but spasmodic or rhythmic reference must apparently be indulged in until our editorial boards eventually see the "wisdom of (your) ways" and follow suit.

If one chooses to note a certain reference one would have to arrange the content in varying manner, the form utilized depending on the medium of publication employed. Recently a perusal of ten journals appearing alphabetically on our library reference shelf presented the following potential variations of a reference chosen at random:

1. Tuckwiler, P. A.: Am. J. Med. Sc. **184,** 473, 1932 (no title) *(American Journal of the Medical Sciences).*
2. Tuckwiler, P. A.: Title. Am. J. Med. Sc., **184,** 473, 1932 *(American Journal of Tropical Medicine).*
3. Tuckwiler, P. A.: Title, Am. J. M. Sc. **184:** 473 (Aug.) 1932 (THE JOURNAL).
4. Tuckwiler, P. A.: Title, Am. J. M. Sc., 1932, 184, 473 *(American Review of Tuberculosis).*
5. Tuckwiler, P. A. 1932 Title. Am. J. Med. Sc., vol. 184, pp. 473- *(Anatomical Record).*
6. Tuckwiler, P. A.: Title, Am. J. Med. Sc. **184:** 473- (Aug.) 1932 *(Anesthesiology).*
7. Tuckwiler, P. A.: Title, Am. Jr. Med. Sc. 1932, clxxxiv, 473 *(Annals of Internal Medicine).*
8. Tuckwiler, P. A.: Title, Am. J. Med. Sc. 184: 473 (Aug.), 1932 *(Annals of Otolaryngology, Rhinology and Laryngology).*
9. Tuckwiler, P. A.: Title, Am. Jour. Med. Sc. **184,** 473, August, 1932 *(Annals of Surgery).*
10. Tuckwiler, P. A. *Am. J. Med. Sci.* **184,** 473 (1932) *(Archives of Biochemistry).*

Note that the only true uniformity concerns the position of the author's name. Most journals follow the author with a colon; two in this group use the period. Some prefer titles others do not. The date of publication is placed first by some, last by others, and one even specifies parenthetical enclosure. The month of publication is mandatory in some journals but deleted in others. Roman numerals are still utilized (7) for volume designation but fortuitously not too frequently. Abbreviations concerning the journal cited are surprisingly consistent, but even here some must be individualistic and stray aberrantly by using Sci. instead of Sc. (10), Jr. (7) and Jour. (9) instead of J. The closest approximation to similarity is between numbers 3, 6 and 8, but note that even in 6 the pages covered by the article are specified, e. g. 473-4?? etc. and 8 employs the comma after the parentheses.

Enough to prove the point; to have peregrinated further would not only have been discouraging but probably nauseating as well. Must some editorial boards still insist on utilizing the same pattern only because a change or break in consistency is traditionally resisted? Can there be better reasons? Why not all conform to THE JOURNAL and *Quarterly Index* pattern, to which many editors now conform? Standardization in this situation would be generally appreciated.

FREDRICK F. YONKMAN, M.D., Detroit.
Professor of Pharmacology and Therapeutics,
Wayne University College of Medicine.

THE OPTIMAL TEST DOSE IN TUBERCULOSIS RESEARCH

To the Editor:—It would be desirable to obtain an unassailable degree of protection against human tuberculosis. But how much are we willing to accept, at a time when BCG, good diagnosis, segregation, rest in bed for a year, collapse therapy, adequate vitamin intake and the intriguing but elusive prospect of drug or enzyme therapy are just about all that we have established in this field?

The chronic disease itself is intrinsically and indirectly just as great a problem as the actual number of deaths it causes. Most human tuberculosis is not fatal, though it spreads in households and institutions and may cause great misery and economic loss. The recognizable disease is but seldom contracted by a casual infection, in the street car or subway, but usually by several subfatal doses in a dwelling permeated with infection.

From these facts it follows that significant protection against even 1 minimum lethal dose might be quite helpful against special risks, even if not all that is desired. Yet nearly all tuberculosis research has been done with 10, 100 or 1,000 minimum lethal doses in an animal (the guinea pig), in which 1 minimum lethal dose is often so small an amount as to be difficult to measure without error.

I have recently seen significant protection (*Proc. Soc. Exper. Biol. & Med.,* October 1943) against subfatal and just about fatal doses of tubercle bacilli in rabbits (and even guinea pigs) by the use of the "asphyxiated tuberculosis vaccine." But I anticipate that some one may "explode" this vaccine by testing it with 1,000 minimum lethal doses in the guinea pig. Vaccination also will be opposed even without further test by many who have seen failure of protection by other killed vaccines against colossal test doses.

TRUMAN SQUIRE POTTER, M.D.,
Laboratory of Preventive Medicine,
University of Chicago.

SIMPLIFIED PLASTER OF PARIS TECHNIC FOR LARGE PLASTERS AND SHELLS

To the Editor:—The war has brought increased interest and demands for the use of plaster of paris. The article by Capt. I. V. Luck in THE JOURNAL, January 1, analyzes the requirements for good plaster technic as carried out with bandages, splint and slabs. In my experience the use of "plaster towels" made up of old rags, towels and sheets and impregnated with plaster pie as recommended by F. Calot-Paris in 1926 is a great improvement because it saves time, is less expensive and is more durable and elegant. I am using it in various orthopedic hospitals after spine and hip operations which require especially fast and reliable plaster protection.

Discarded regular size towels, rags, four layers of crinoline or any rough texture material measuring 15 by 20 inches for posterior shells and hip spicas or 5 by 20 inches for arm or leg splints, after being wrung out in warm water, are soaked in homogeneous plaster of paris pie (ratio 6 cups of powder to 4 cups of lukewarm water), adapted to the body contour and molded snugly. While the hardening plaster pie is renewed after six to eight layers they can be reinforced by one 6 inch plaster bandage and molded until the "critical point" of setting is reached. More layers are added, usually up to twelve, until the necessary strength is reached. The edges can be trimmed the following day, and the shell is padded and covered with stockinet.

ERNEST H. BETTMANN, M.D.,
680 West End Avenue,
New York.

DETERMINATION OF BLOOD SULFONAMIDES

To the Editor:—In the January 1 issue of THE JOURNAL there appeared an article by Dr. Johan T. Peters entitled "Easy and Accurate Method for Determination of Blood Sulfonamides from One Drop of Blood from the Finger Tip." The author quotes extensively our paper on the same subject (Determination of sulfanilamide and Its Derivatives in Blood, *Am. J. Clin. Path.*, Tech. Supp. **6**:22 [March] 1942) and, in the main, concurs with our findings and suggestions.

On page 32, Dr. Peters states that "Churg's method was tried, which, compared with its predecessors, has many advantages. The method using sulfanilamide standards requires up to now, according to the description, 1 cc. of blood and has therefore to be considered as a macro method, as are all methods which use more than one drop of blood." The author then proposes in his micro modification for determination of "free" sulfanilamide only the use of 0.25 cc. of blood, which is certainly more than one drop. Dr. Peters apparently overlooked that 1 cc. of blood was suggested by us for the determination of both free and total sulfanilamide, whereas 0.5 cc. represents the actual maximum amount required for a single determination. Moreover, as stated in our publication on page 23, determination of free sulfanilamide "can be performed even on 0.2 ml. of blood. . . . By the use of narrow comparison tubes . . . it is possible to determine the drug concentration in 0.1 ml. of blood." In addition, on the same page of our publication reference is made to an earlier report with which Dr. Peters seems to be unfamiliar, entitled "A Simple Micro Test for Sulfanilamide and Its Derivatives in Blood," published in the *American Journal of the Medical Sciences* (**202**:687 [Nov.] 1941) and based on the same principles. Compared with the latter method, the procedure of Dr. Peters appears to have several drawbacks which handicap its usefulness, especially as an office and bedside test:

1. The amount of blood necessary for a single determination is considerable (0.25 cc. instead of 0.1 cc. as recommended by us) and often difficult to obtain from the finger tip, even by a trained technician.

2. Hemolysis with saponin, a procedure abandoned in our method, is reintroduced, thus increasing the number of reagents. The close agreement of values obtained with the method of Bratton and Marshall and our micro test proved that in aqueous blood dilutions of 1:20 or more the use of saponin can be safely omitted. The introduction of a mortar and pestle represents another time consuming and cumbersome addition.

3. The necessity of keeping standard solutions of sulfanilamide and preparing standards every two weeks certainly complicates the test. Artificial standards as suggested by us (mixture of solutions of potassium dichromate and potassium chromate) are not only permanent but, for an average eye, match the sulfanilamide standards very well. Of course, color perception varies, and perhaps to some persons these artificial standards may appear slightly different in shade. Furthermore, the color produced by sulfanilamide derivatives does not match exactly the color of sulfanilamide itself, whether determination is done with p-dimethylaminobenzaldehyde or by the diazotization according to Marshall. In order to obtain an absolutely perfect match, a stock of standard solutions for each and every sulfonamide derivative would have to be maintained.

Moreover, the reduction in the number of standards as suggested by Dr. Peters (four instead of eleven) also diminishes range and accuracy very much. Permanent standards, on the other hand, can be used in considerable numbers and closely spaced, thus increasing the accuracy of the reading and the range of the method.

With regard to the well known color reaction between Ehrlich's reagent and urobilinogen, which gives a strongly pink color, Dr. Peters mistakingly quoted as our finding (p. 32) that the color reaction with urobilinogen is fifty times weaker than with the sulfonamides. Since the sulfonamides give a yellow color, direct comparison with urobilinogen would not be possible.

To summarize, the procedure suggested by Dr. Peters requires much more blood, is technically more complicated and less accurate and therefore offers no advantages over the micro test proposed by us in 1941. Consequently, the latter test seems to answer better the needs of the physician or of a small laboratory.

JACOB CHURG, 1st Lieutenant,
M. C., A. U. S.
DAVID LEHR, M.D.,
Instructor in Pharmacology,
New York Medical College, Flower
and Fifth Avenue Hospitals.

REGULATIONS ON THE CARE OF WIVES AND CHILDREN OF ENLISTED MEN

To the Editor:—What purpose is accomplished by cluttering our very fine journal with such nonsensical material smearing pages 241-246 of the January 22 issue, when the entire program could have been condensed in one-half to one page?

I note in page 245 that some crackpot in the Children's Bureau, doubtless a former worker in bric-a-brac, has stated "there shall be a separate bed for each patient." Doubtless this statement should be called to the attention of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, as it marks a profound advancement brought to us by socialized medicine, under the Emergency Maternity and Infant Care Program.

GERALD E. MURPHY, M.D., Mount Morris, N. Y.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

EXAMINING BOARDS IN SPECIALTIES

Examinations of the Examining Boards in Specialties were published in THE JOURNAL, Feb. 12, page 461.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, Feb. 21-24. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

ARIZONA:* Phoenix, April 4-5. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS:* March. Sec., Dr. D. L. Owens, Harrison. *Eclectic.* Little Rock, June 8. Sec., Dr. C. H. Young, 1415 Main St., Little Rock.

COLORADO:* Denver, April 4-7. Sec., Dr. J. B. Davis, 831 Republic Bldg., Denver.

CONNECTICUT:* *Medical. Written.* Hartford, March 14-15. *Endorsement.* New Haven, March 28. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven. *Homeopathic.* Derby, March 13-14. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven.

DISTRICT OF COLUMBIA:* *Reciprocity.* Washington, March. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA:* Jacksonville, June 26-27. Sec., Dr. W. M. Rowlett, Box 786, Tampa.

ILLINOIS: Chicago, April 4-6. Supt. of Registration, Department of Registration and Education, Mr. Philip Harman, Springfield.

INDIANA: Indianapolis, May 2-4. Sec., Board of Medical Registration and Examination, Dr. W. C. Moore, 301 State House, Indianapolis.

MAINE: Portland, March 14-15. Sec., Board of Registration of Medicine, Dr. A. P. Leighton, 192 State St., Portland.

MASSACHUSETTS: Boston, March 14-17. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F State House, Boston.

MISSOURI: St. Louis, August. Sec., State Board of Health, Dr. James Stewart, State Capitol Bldg., Jefferson City.

MONTANA: Helena, April 3-5. Sec., Dr. O. G. Klein, First National Bank Bldg., Helena.

NEW HAMPSHIRE: Concord, March 9-10. Sec., Board of Registration in Medicine, Dr. D. G. Smith, State House, Concord.

NEW MEXICO:* Santa Fe, April 10-11. Sec., Dr. LeGrand Ward, 141 Palace Ave., Santa Fe.

NEW YORK: Albany, Buffalo, New York City and Syracuse, June 26-29. Sec., Dr. R. R. Hannon, Education Bldg., Albany.

NORTH DAKOTA: Grand Forks, July 5-8. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

RHODE ISLAND: * Providence, April 6-7. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.
SOUTH CAROLINA: Columbia, June 26-28. Sec., Dr. N. B. Heyward, 1329 Blandena St., Columbia.
TEXAS: Houston, March 22-24. Final date for filing application is March 10. Sec., Dr. T. J. Crowe, 918-20 Texas Bank Bldg., Dallas.
WEST VIRGINIA: Charleston, May 1-3. Commissioner, Public Health Council, Dr. John E. Offner, State Capitol, Charleston.
WISCONSIN: * Milwaukee, June 27-29. Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARKANSAS: *Little Rock, March 6. Sec., Mr. L. E. Gebauer, 701 Main St., Little Rock.
COLORADO: Denver, March 8-9. Sec., Dr. E. B. Starks, 1459 Ogden St., Denver.
DISTRICT OF COLUMBIA: Washington, April 17-18. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.
FLORIDA: Gainesville, June 8. Sec., Dr. J. F. Conn, John B. Stetson University, DeLand.
IOWA: Des Moines, April 11. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.
MICHIGAN: Ann Arbor and Detroit, May 12-13. Sec., Miss Eloise LeBeau, 101 N. Walnut St., Lansing.
MINNESOTA: Minneapolis, April 4-5. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis.
NEBRASKA: Omaha, May 2-3. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln.
OREGON: Portland, March 4. Sec., Board of Higher Education, Mr. C. D. Byrne, University of Oregon, Eugene.
SOUTH DAKOTA: Vermillion, June 4-5. Sec., Dr. G. M. Evans, Yankton.
WISCONSIN: Madison, April 1. Sec., Prof. R. N. Bauer, 152 W. Wisconsin Ave., Milwaukee.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Acute Appendicitis Mistaken for Extrauterine Pregnancy: Emergency as Creating Implied Consent to Different Operation than That Expressly Authorized.—The patient, while pregnant, complained of pains in her lower right abdomen and of nausea, and her attending physician, Dr. Harris, made a diagnosis of extrauterine pregnancy. At his request Dr. Bachrach, a surgeon, was called in for consultation. He made a pelvic examination, finding a mass the size of a small orange in the right ovarian region. Dr. Bachrach then confirmed Dr. Harris's diagnosis and advised an immediate operation, which was performed by Dr. Bachrach. Apparently the only express authority given Dr. Bachrach was to remove the supposed tubal pregnancy. On opening the abdomen the surgeon ascertained that the diagnosis of extrauterine pregnancy was incorrect, that the patient had a double uterus, that a normal pregnancy was present, and that there was "a very acute appendix," which he removed. In the surgeon's opinion the patient made an uneventful recovery and the two physicians involved in the case were satisfied that the source of the patient's trouble had been removed. Subsequently at normal term and in a normal way the patient gave birth to a normal child. Later Dr. Bachrach sued the patient's husband to recover compensation for the performance of the operation. The husband resisted the surgeon's claim on the sole ground that the appendix had been removed without the consent of himself or his wife and that the operation, having gone further than was authorized, constituted a trespass or assault on the wife. From a judgment in favor of the surgeon the defendant appealed to the municipal court of appeals for the District of Columbia.

We recognize and follow, said the municipal court of appeals, the rule announced in *Schloendorff* v. *Society of New York Hospital*, 211 N. Y. 125, 105 N. E. 92, in which Justice Cardozo said:

> Every human being of adult years and sound mind has a right to determine what shall be done with his own body; and a surgeon who performs an operation without his patient's consent commits an assault, for which he is liable in damages. . . . This is true, except in cases of emergency where the patient is unconscious, and where it is necessary to operate before consent can be obtained.

The question in this case is whether an emergency existed so as to justify the removal of the appendix without the express consent of the patient. To answer this question we must look at the picture through the eyes of the surgeon. The patient lay before him on the operating table, her abdomen laid open, and unconscious from the anesthetic. Her pregnancy was a normal one in the uterus and not tubal as he and the attending physician had thought it was. She did reveal a very unusual structural condition in the form of a double uterus. More immediately important, he beheld a very acute appendix with all its potentially dangerous consequences. What was he to do? Should he have left her on the operating table, her abdomen exposed, and gone in search of her husband to obtain express authority to remove the appendix? Should he have closed the incision on the inflamed appendix and subjected the patient, pregnant as she was, to the danger of a general spread of the poison in her system, or to the alternative danger and shock of a second, independent operation to remove the appendix? Or should he have done what his professional judgment dictated and proceed to remove the offending organ, regarded as it is as a mere appendage serving no useful physiologic function and causing only trouble, suffering, and oft-times death? The defendant does not claim that the surgeon used bad judgment, or that the operation was not dictated by sound surgical procedure, or that it was a failure. He claims only that it was unauthorized and makes no real showing of resulting injury or damage. True, the patient claimed she had had no abdominal pains before the operation; but if that is so it is difficult to understand why the plaintiff was called in at all. The patient further complained of suffering and inability to get around and climb stairs after the operation, but we take judicial notice that such is the normal sequel of most surgical operations, especially in presence of pregnancy. This case is not one in which a patient was rendered barren; on the contrary, her fetus was not disturbed and she achieved motherhood in a normal manner. Nor was she crippled or otherwise mutilated; on the contrary, the operation was a success, and she is forever relieved from the fear and danger of appendicitis. And yet we are asked to deny the surgeon's fee because he comes into court unable to show express authority for the excision he made. It seems to us that to adopt that view would be granting poor reward indeed for faithful professional service. Moreover, this would require us to shut our minds and eyes, as judges, to "truths that all others can see and understand." To accept this view, we would have to deny that it was an emergency and declare a rule which would tend to make every surgeon litigation conscious instead of duty conscious as he stands, scalpel in hand, over his unconscious patient. This we decline to do. We hold the law to be that in case of emergency a surgeon may lawfully perform, and it is his duty to perform, such operation as good surgery demands even when it means extending the operation further than was originally contemplated; and that for so doing he is neither to be held in damages nor denied recovery of his fee. The law should encourage self-reliant surgeons to whom patients may safely entrust their bodies, and not men who may be tempted to shirk from duty for fear of a law suit. The law does not insist that a surgeon shall perform every operation according to plans and specifications approved in advance by the patient, and carefully tucked away in his office safe for courtroom purposes.

The court accordingly held that under the present circumstances authority to proceed with the operation was born of the emergency and conferred on the surgeon the legal right to proceed as he did. The judgment in favor of the surgeon was accordingly affirmed.—*Barnett v. Bachrach, 34 A. (2d) 626 (Dist. of Col., 1943).*

Society Proceedings

COMING MEETINGS

Arizona State Medical Association, Phoenix, April 14-15. Dr. Frank J. Milloy, 112 N. Central Ave., Phoenix, Secretary.
Florida Medical Association, St. Petersburg, April 13-14. Dr. Shaler Richardson, 111 West Adams St., Jacksonville, Secretary.
Minnesota State Medical Association, Rochester, April 13-15. Dr. B. B. Souster, 493 Lowry Medical Arts Bldg., St. Paul, Secretary.
New Orleans Postgraduate Medical Assembly, New Orleans, March 6-9. Dr. Joseph S. D'Antoni, 1430 Tulane Ave., New Orleans 13, Secretary.
Northern Tri-State Medical Association, Toledo, Ohio, April 11. Dr. Oscar P. Klotz, 127 W. Hardin St., Findlay, Ohio, Secretary.
Tennessee State Medical Association, Nashville, April 11-13. Dr. H. H. Shoulders, 706 Church St., Nashville, Secretary.
Tri-States Medical Association of the Carolinas and Virginia, Charlotte, N. C., Feb. 28-29. Dr. James M. Northington, 804 Professional Bldg., Charlotte, N. C., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

26:577-720 (Nov.) 1943

Structure and Innervation of Conductive System of Heart of Dog and Rhesus Monkey, as Seen with Silver Impregnation Technic. J. F. Nonidez.—p. 577.
*Capillary Studies in Migraine: Effect of Ergotamine Tartrate and Water Diuresis. W. Redische and R. H. Pelzer.—p. 598.
*Blood Pressure in Essential Hypertension: Effect of Several Reputedly Hypotensive Drugs. J. S. Kapernick.—p. 610.
Normal Blood Pressure in Lower Extremity. M. H. Wendkos and P. L. Rossman.—p. 623.
Comparison of Actions of Four Cardiac Glycosides on Patient with Congestive Heart Failure. L. W. Eichna and T. Taube.—p. 631.
*Subarachnoid Hemorrhage Caused by Ruptured Intracranial Aneurysm. A. L. Sahs and P. G. Keil.—p. 645.
Electrocardiographic Considerations in Small Animal Investigations. M. B. Rappaport and I. Rappaport.—p. 662.
Prognostic Significance of Age at Onset of Initial Attacks of Rheumatic Fever. Elvira M. DeLiee, Katherine G. Dodge and C. McEwen.—p. 681.
Tongue Sign for High Venous Pressure. A. M. May.—p. 685.
Phonocardiogram in Spontaneous Interstitial Emphysema of Mediastinum. A. M. Hoffman, F. W. Pobirs and R. Merliss.—p. 686.
Aneurysm of Pulmonary Artery: Report of Case in Which Aneurysm Apparently Developed Under Observation. A. S. Hartwell and I. L. Tilden.—p. 692.
Staphylococcus Aureus Septicemia, with Osteomyelitis, Pneumonia and Acute Purulent Pericarditis: Case Report. R. R. Impink, E. Denhoff and J. B. Vander Veer.—p. 699.

Capillary Studies in Migraine.—Redisch and Pelzer studied changes in the capillaries of the body surface of 118 patients in the Migraine Clinics at Bellevue Hospital and New York University College of Medicine. Repeated observations were made on 98 patients. Observations made during migraine attacks indicated the occurrence of a regular tendency to indistinctness or "blurring" of the capillary outline; this was less definite during the interval between attacks. Blurring was found to be present during migraine attacks and absent or diminished during the headache free interval in over three fourths of the cases. The state of visibility varied even during the period of a single observation. The peripheral capillary effect of an intravenous injection of 0.25 and 0.5 mg. of ergotamine tartrate during the migraine attack was watched under the microscope, and photographs were made in 23 instances among 16 patients. Two to five minutes after the injection the original "blurring" tended toward alternation between clearing and indistinctness. During this interval pronounced variations in diameter also took place. The indistinctness tended to increase with nausea. Eight to fifteen minutes after the injection the capillaries appeared much clearer and narrower, and subjective relief was simultaneously experienced by the patient. Subsequently the distinctness of the capillary outline again varied considerably. Thirty to forty-five minutes after the injection the loops again became blurred. The possibility that a disturbance in the water balance existed during the migraine attack induced studies on the water diuresis. Observations during migraine attacks induced by forced water ingestion seem to indicate a relationship between the fluid balance of the body, the state of the peripheral capillaries and the migraine attack.

Blood Pressure in Essential Hypertension.—Kapernick points out that a recent listing reveals almost 100 names of "hypotensive" drugs. The claim of "successful" treatment of essential hypertension often is based on symptomatic improvement rather than on a substantial reduction of the blood pressure. Some insist that symptomatic improvement is a sufficient end in itself, that reduction in blood pressure is undesirable and that if the latter condition is established the patient may suffer. Some observers believe to the contrary that reduction of blood pressure is the essential aim of treatment. The fact that symptoms of hypertension can be controlled in many ways and that with excellent symptomatic control available the mortality rate has not been reduced suggests that symptoms associated with hypertension do not measure any factor contributing to death of these patients. The author studied the effects of a number of widely recommended drugs on patients in a state hospital for the insane. Few of these patients complained of symptoms of elevated blood pressure, although some were ill from the consequences of it. The patients included those with schizophrenia, manic depressive psychosis, depression, arteriosclerosis of the vessels of the central nervous system and other types of mental disturbances. All patients were hypertensive men, with ages ranging from 38 to 70 years. All patients ate the same meals and were subjected to much the same environment and routine. Among the drugs experimented with were theobromine, a prepared combination of theobromine and phenobarbital sodium (theominal), an arterial antispasmodic agent (iocapral), aminophylline, erythrol tetranitrate, hepvisc (a synergistic combination of Viscum album [European mistletoe] and hepatic and insulin free pancreatic extracts) and allimin, which is stated to be a synergized combination of garlic concentrate and parsley concentrate. This study demonstrated that these drugs administered continuously in optimal dosage for periods of thirty days failed to exhibit any significant hypotensive effect on the blood pressure of hypertensive patients. A sustained, significant reduction in blood pressure was not noted in a single instance.

Subarachnoid Hemorrhage Caused by Intracranial Aneurysm.—Sahs and Keil direct attention to the fact that the term "spontaneous subarachnoid hemorrhage," which has been used for many years to designate meningeal bleeding of nontraumatic origin, is confusing and meaningless and should be discarded. In the majority of instances such conditions as ruptured intracranial aneurysm, extension of a massive cerebral hemorrhage into the subarachnoid space, hemorrhage from a neoplasm, meningeal inflammation or a blood dyscrasia can be established as the cause. The authors review the clinical features in 64 cases in which a diagnosis of subarachnoid hemorrhage caused by ruptured intracranial aneurysm was made. The presence of an aneurysm was verified by postmortem examination in 12 instances. The etiologic factors commonly given are congenital weakness of vessel walls, arteriosclerosis, inflammation and trauma. The authors feel that long standing structural weakness of the vessel wall plus the mechanical factors induced at bifurcations offers a logical explanation for the majority of these aneurysms. This is a disorder of middle adult life, although bleeding may occur at any age. The most consistent symptom is sudden onset of pain in the head. The symptoms and signs of meningeal irritation make their appearance soon afterward. The presence of blood in the spinal fluid is a valuable aid in diagnosis. Case reports are included to show variations in the clinical manifestations. Of the 64 patients examined, 18 died in the hospital, 22 were discharged well and 24 were improved but were left with sequelae such as hemiplegia, ocular palsy, aphasia and visual field disturbances. The prognosis must be guarded in every case. Recurrences often take place. The mortality is higher in older persons and in patients who have arterial hypertension. The treatment is principally symptomatic. Rest in bed and sedatives are necessary during the acute phase. Avoidance of undue excitement is indicated. Repeated lumbar punctures are of doubtful efficacy. Some of the patients with large, localizable aneurysms can be improved or cured by surgical means.

American Journal of Clinical Pathology, Baltimore

13:569-626 (Nov.) 1943

Morphology and Pathogenesis of Hepatic Cirrhosis. H. T. Karsner.—p. 569.
Metaplasia of Prostatic Epithelium: Lesion Sometimes Mistaken for Carcinoma. E. B. Sutton and J. R. McDonald.—p. 607.
Criticism of Methods Presented by C. A. Hellwig. J. Beeman and N. A. David.—p. 616.
Reply to Beeman and David. C. A. Hellwig.—p. 618.

American J. Obstetrics and Gynecology, St. Louis

46:623-772 (Nov.) 1943. **Partial Index**

Consideration of Certain Factors Pertaining to Control of Carcinoma of Cervix. N. F. Miller.—p. 625.
*Some Determinants of Maternal and Plasma Vitamin C Levels. C. J. Lund and M. S. Kimble.—p. 635.
*Low Dosage Irradiation in Treatment of Amenorrhea. C. Mazer and R. Greenberg.—p. 648.
*Use of Hypnoidal State as Amnesic, Analgesic and Anesthetic Agent in Obstetrics. W. S. Kroger and S. T. DeLee.—p. 655.
Basal Metabolic Rate, Basal Body Temperatures, and Ovarian Cycle. W. W. Williams.—p. 662.
Transfer of Sodium Across Human Placenta. A. Gellhorn, L. B. Flexner and L. M. Hellman.—p. 668.
Rectal Stricture Complicating Labor. I. H. Kaiser.—p. 672.
Ectopic Pregnancy. D. M. Farell.—p. 686.
Intrinsic Risk of Breech Delivery. P. Tompkins.—p. 695.
Gestational Neuronitis, Deficiency Disease. A. C. Posner.—p. 700.
Ectopic Decidua in Vermiform Appendix. S. Sanes and A. F. Liber.—p. 719.
Recovery After Cesarean Hysterectomy. L. D. Odell.—p. 722.
Uterine Apoplexy Following Elective Second Cesarean Section. S. C. Hall.—p. 734.
Chorionepithelioma with Regression of Primary Uterine Tumor. M. E. Maun and W. M. Green.—p. 738.
Use of Willett Clamp for Scalp Traction in Delivery. D. F. Kaltreider and H. B. McNally.—p. 744.
Axial Torsion of Gravid Uterus in Two Successive Pregnancies. J. E. Corr.—p. 749.

Maternal and Plasma Vitamin C Levels.—Lund and Kimble determined the vitamin C content of more than 500 samples of blood obtained from 197 women at different stages of pregnancy. Most of the samples came from a group of 46 women who were studied three or more times throughout pregnancy. One hundred and fifty-one mothers were observed once or twice during pregnancy, and 110 of these mothers and their infants were observed at the time of delivery. The plasma vitamin C level reflects the dietary intake of this substance. The mean plasma value for mothers with an adequate diet was 0.95 mg., with a fair diet 0.52 mg. and with a poor diet 0.18 mg. per hundred cubic centimeters. During the summer months diets poor in vitamin C were uncommon (7 per cent). During the remainder of the year 20 per cent had poor diets. Optimal values can be maintained by diet alone. Fresh citrus fruits, tomatoes and berries are excellent sources of ascorbic acid, and at least one of this group of fruits should be eaten each day during pregnancy. Small doses of ascorbic acid, such as 25 mg. daily, are of little benefit alone. They may lead the physician into a false sense of security unless he realizes that the daily requirements of the pregnant woman are much greater. If the woman receives an adequate diet there is no need for synthetic ascorbic acid. Blood levels of vitamin C did not change during labor. They tended to be slightly lower during the early puerperium and were definitely but not alarmingly lower after delivery by cesarean section. Hyperemesis gravidarum may lead to dangerously low levels of vitamin C. Clinical scurvy may appear. The retinal hemorrhages of severe hyperemesis gravidarum are a manifestation of vitamin C deficiency and are similar to petechial hemorrhages seen elsewhere. These hemorrhages cease after adequate therapy with vitamin C; henceforth they are not necessarily an indication for the use of therapeutic abortion. The fetus receives its supply of vitamin C at the expense of the mother and, under fasting conditions, the fetal values are always higher than those of the mother, the difference being relatively greatest when maternal values are low. Fetal blood vitamin C may be maintained at a level higher than the mother's by a process of selective retention by the placenta.

Low Dosage Irradiation in Amenorrhea.—A follow-up for three years of 92 additional cases of amenorrhea treated with low dosage irradiation of the pituitary gland and ovaries revealed to Mazer and Greenberg that 65 (72 per cent) of these patients have been menstruating normally. Data gathered from a long term follow-up of 165 cases, similarly treated and previously reported, show permanence of the cures and safety of the procedure to both the patient and her offspring. Of the 92 amenorrheic patients in the present group, 54 desired offspring but had not conceived despite the intensive use of organotherapy and other measures for several years. Twenty-eight (54 per cent) of the 54 barren women conceived and carried to term healthy infants; 2 aborted during the first trimester of pregnancy. All the 30 women have been menstruating normally since the termination of pregnancy. Low dosage irradiation of the pituitary gland and ovaries for the relief of amenorrhea should not be administered without a preliminary pelvic examination and a dependable biologic pregnancy test, unless the patient happened to have menstruated a couple of weeks previously. Literature on low dosage irradiation of the pituitary gland and ovaries, as employed for the relief of amenorrhea, reveals no adverse effects either on the patients or on their offspring. Instances of harm recorded in the literature were the result of heavy irradiation employed in the treatment of uterine fibroids and kindred conditions. The importance of employing a uniform technic and dosage is emphasized, for the boundary line between the clinically effective and the injurious dose of roentgen rays has not been determined.

Use of Hypnoidal State in Obstetrics.—Kroger and DeLee believe that the only method of relief of pain in childbirth which has complete safety for mother and baby without altering the normal mechanism of labor is hypnosis. Since 1931 Kroger has successfully managed the entire course of eleven out of twelve confinements with this method. There was only one failure. Ten patients were primiparas and 1 was a multipara; the latter was delivered twice under hypnosis. Prophylactic forceps, episiotomy and perineorrhaphy were performed on all. The patient was placed in a deep hypnotic state before the seventh month of gestation. Posthypnotic suggestions were made to the effect that the labor would be entirely painless, that she would have no recollection of the entire procedure and that she would look forward to her confinement with a feeling of joy and happiness instead of dread and anticipation. Posthypnotic suggestions last about a month, and, when repeated often enough, the effect will become permanent. The patient returns every two weeks and the same suggestions are repeated to her in the hypnotic trance, which is a state of increased hypersuggestibility. It is imperative that the gravida maintain complete confidence and rapport with the operator. Suggestions must be dignified at all times. During labor, hypnotic sleep is induced when the cervix is dilated between 2 and 4 centimeters. The patient is told that her sleep will be deep and continuous. Also she will hear only the commands of the person placed en rapport with her. After careful preparation these women will be most cooperative during labor. They lie motionless and require no attention except routine care. The normal mechanism of labor is not interfered with and the gravida can be told to bear down with each contraction, thereby facilitating the completion of the expulsive stage. The respiration is diaphragmatic in type, the pupils are usually fixed and dilated. The limbs can be made cataleptic or flaccid during the delivery and complete relaxation of the entire body can be produced by command. Any type of operative delivery is facilitated. The hypnoidal state is a safe amnesic, analgesic and anesthetic agent. There are no untoward effects on the mother or baby.

American Journal of Surgery, New York

62:293-432 (Dec.) 1943

Progress in Management of Hemorrhoids. E. T. Whitney and G. Angelo.—p. 296.
Preoperative and Postoperative Treatment of Toxic Thyroid. F. E. Sanford.—p. 309.
Effects of Pyridium in Certain Urogenital Infections. T. J. Kirwin, O. S. Lowsley and J. Menning.—p. 330.
Prognosis in Prolonged Unconsciousness Following Head Injury. C. D. Hawkes.—p. 336.
Pathogenesis and Experimental Therapy of Keloids and Similar Neoplasms in Relation to Tissue Fluid Disturbances. W. Marshall and S. Rosenthal.—p. 348.
*Chlorophyll: Experimental Study of Its Water Soluble Derivatives in Wound Healing. L. W. Smith and A. E. Livingston.—p. 358.
Implantation of Ureters into Large Intestine: Report of 2 Cases. R. S. Fowler.—p. 370.
Knee Joint Arthrotomy in Military Life. B. B. King.—p. 382.
Further Experience with Pilonidal Cysts at Fort Sill, Oklahoma. W. J. Pickett and M. P. Meyers.—p. 387.
Tenosynovitis: Industrial Disability. J. V. Reed and A. K. Harcourt.—p. 392.
Anisoauria in Congenital Torticollis. S. Stone.—p. 397.

Water Soluble Derivatives of Chlorophyll in Wound Healing.—Smith and Livingston studied the healing effect on wounds of water soluble chlorophyll preparations made up as solutions, jellies and ointments in the treatment of experimentally induced burns and wounds in rats, guinea pigs, rabbits

and dogs and in a small number of clinical cases. The agents tested included chlorophyll (aqueous soluble derivatives) in five vehicles, vitamin A, vitamin B complex, vitamin C ointments, biodyne ointment, methionine ointment, Castilian malva infusion, sulfanilamide powder, sulfathiazole powder and ointment, sulfadiazine spray, scarlet red ointment and tetrodine dusting powder. The experiments fall into three groups: (1) the healing of experimentally produced clean surgical wounds, (2) the healing of experimentally infected surgical wounds and (3) the healing of experimentally induced dry heat burns. In each of the three groups there were carried out eighteen separate experiments with each type of animal used, based on the seventeen preparations under study. In the small animals a single test area was used with a corresponding control area on the opposite side. In dogs eight lesions were produced, two of which served as controls and six as test areas. The total number of wounds and burns studied amounted to 1,372, while the control series numbered 878 lesions. Chlorophyll preparations alone consistently showed statistically significant effects in accelerating the healing of both traumatic and thermal wounds. In 304 out of 448 lesions (67.9 per cent) wound healing was accelerated by 24.9 per cent in time. Vitamin B, C and D ointments showed no appreciable effect. Biodyne and methionine ointments and Castilian malva wet dressings (infusion) caused a slight acceleration of healing in somewhat less than a third of the cases, but of less than 10 per cent in time. The sulfonamide compounds caused definite retardation of the healing process except in the presence of active infection. Scarlet red ointment acted merely as a protective dressing similar to boric ointment or petrolatum gauze. Tetrodine, an active, stable, aqueous soluble iodine preparation (with an iodine content of 4 per cent combined iodine and 2 per cent free iodine) reduced the healing time in about half the cases when infection was present. In the absence of infection some slight delay in healing was found presumably because of minor tissue irritation. On the basis of these observations it is suggested that chlorophyll preparations should be used extensively in the treatment of wounds and burns.

American Journal of Tropical Medicine, Baltimore

23:569-628 (Nov.) 1943

Annotated List of Bloodsucking Insects, Ticks and Mites Known from Panama. G. B. Fairchild.—p. 569.
Cultivation in Vitro of B. Leprae with Thiamine (Vitamin B_1) Culture Medium. W. L. Loving.—p. 593.
*Immunization Against Malaria: Increased Protection by Vaccination of Ducklings with Saline Insoluble Residues of Plasmodium Lophurae Mixed with a Bacterial Toxin. H. R. Jacobs.—p. 597.
*Histogenesis of Experimental Icterohemorrhagic Spirochetosis in Albino American Deer Mice (Peromyscus Maniculatus Gambelii). L. L. Ashburn and A. Packchanian.—p. 607.
Modification of N. N. Medium for Cultivating Trypanosoma Cruzi. N. Tom.—p. 615.

Immunization Against Malaria.—The water insoluble plasmodial residues of Plasmodium lophurae appear to contain antigens which stimulate the formation of protective antibodies in the duckling. The experiments presented indicate that antigens are present in plasmodial materials, but that they are either too insoluble or only partially antigenic or both. The notable increase in protective antigenicity wrought by the addition of a bacterial toxin supports the proposed hypothesis that plasmodial material contains a hapten antigen which (*a*) does not efficiently provoke antibody production and (*b*) combines with the protective antibodies that are formed. Immunity to malaria was probably not produced. The most that has been achieved is an increased protection. The way may have been cleared to the elaboration of a good vaccine. The next logical step is to render the useful plasmodial material more soluble. The role of the bacterial toxin is entirely hypothetical. Staphylococcus toxin was used because Burky and others showed that this substance, when combined with nonantigenic materials, served to make the latter antigenic.

Experimental Icterohemorrhagic Spirochetosis in Mice.—Ashburn and Packchanian point out that until recently guinea pigs were the only known satisfactory experimental animals for the study of Weil's disease. Other American rodents are susceptible to infection with Leptospira icterohemorrhagiae. For this study 30 albino deer mice (Peromyscus maniculatus gambelii) were used. The animals were inoculated intraperitoneally with a rat strain of Leptospira icterohemorrhagiae and were killed in groups at daily intervals from the second through the seventh day. Jaundice, internal hemorrhage and leptospiras in the blood were first noted on the fifth day. Jaundice and hemorrhage rapidly increased and were severe by the seventh day. Leptospiras were present in the blood in great numbers by the sixth day, but the number had decreased by the seventh day and 1 mouse (previously positive) was negative at this time. The renal cortex, mainly the inner portion, showed progressive changes in the tubular epithelium, including cytoplasmic swelling, dispersion of granules, nuclear enlargement, indistinctness of brush border and, in late stages, lack of adhesions between cells and focal necrosis. Interstitial cellular infiltration was slight and irregular. Pathologic alterations of the liver comprised cell enlargement, increase in number of cellular nuclei, swelling and oxyphilia of some Kupffer cells, necrosis of an occasional parenchymal cell, and disruption of liver cords due to loss of cohesion between cells. Erythrophagia was present on and after the fifth day and was progressive. In the spleen erythrophagia was prominent. Leptospiras were abundant in the liver, much less so in the kidney, and were present in very small numbers in the heart and lungs. The hepatic damage is sufficient to explain the occurrence of jaundice in experimental icterohemorrhagic spirochetosis in deer mice. Intrahepatic biliary obstruction was not observed.

American Review of Tuberculosis, New York

48:361-470 (Dec.) 1943

Beginnings of American Antituberculosis Movement. J. A. Miller.—p. 361.
Analysis of Breathing Pattern. J. L. Caughey, Jr.—p. 382.
*Nutritional Studies in Tuberculosis: I. Prothrombin Deficiency and Vitamin K. J. E. Farber and D. K. Miller.—p. 406.
*Nutritional Studies in Tuberculosis: II. Niacin (Nicotinic Acid) and Riboflavin Deficiency. J. E. Farber and D. K. Miller.—p. 412.
Fluorescence Microscopy of Mycobacterium Tuberculosis: Study of Basic Factors. C. F. Graham.—p. 421.
Demonstration of Tubercle Bacilli by Fluorescence Microscopy: Comparative Evaluation of Fluorescence and Ziehl-Neelsen Methods in Routine Examination of Smears for Acid Fast Bacilli. D. G. Freiman and G. F. Mokotoff.—p. 435.
Autolysis of Tubercle Bacilli and Production of Tuberculin (Tuberculoprotein). H. J. Corper and M. L. Cohn.—p. 443.
Treatment of Experimental Tuberculosis in Vaccinated and Nonvaccinated Guinea Pig with Promin. W. Steenken Jr., F. H. Heise and E. Wolinsky.—p. 453.

Prothrombin Deficiency and Vitamin K in Tuberculosis.—Farber and Miller made more than 700 determinations of the prothrombin time on 400 patients with pulmonary tuberculosis. Approximately 100 control tests were performed on normal persons. Prothrombin deficiency was found in 33 per cent of the nonbleeding and 53 per cent of the bleeding tuberculous patients. Synthetic vitamin K (menadione) restored the plasma prothrombin concentration but had no effect on the hemorrhage. Prothrombin deficiency reflects the clinical status of the patient and is a manifestation of a general nutritional deficiency.

Niacin and Riboflavin Deficiency in Tuberculosis.—Farber and Miller studied 400 tuberculous patients with regard to niacin and riboflavin deficiency. All patients had advanced pulmonary tuberculosis. When evidences of glossitis, stomatitis or cheilosis were noted the patient was selected for more careful study. This included gastric analyses, blood counts and serial prints and photographs of the tongue. About 100, or 25 per cent, of 400 patients with tuberculosis showed definite evidence of niacin and riboflavin deficiency. Fever and the accompanying elevated metabolism of active tuberculosis increase the body requirements of vitamins. In patients with enterocolitis there is impaired retention and absorption and rapid excretion of the essential nutrients. In patients with amyloidosis, particularly of the liver, there might be interference with the utilization of the vitamins. The loss of proteins in renal amyloidosis is also serious. Patients with tuberculous meningitis and other severe forms usually eat poorly and, with increased requirements incident to fever infection, develop deficiency syndromes. Some of the most pronounced niacin deficiency tongues were in this type of patient. The state of

nutrition of a tuberculous person can usually be correlated with the severity of the disease process. The treatment of vitamin deficiency must take into consideration the conditioning factor as well as the specific deficiency. The diet should be liberal and of high vitamin content. Adjuvants such as cod liver oil and tomato juice are valuable. In addition, specific therapy for the nutritional deficiency is indicated. With evidence of niacin deficiency, a minimum dose of 150 mg. should be given daily in divided doses. At least 1 ounce of brewers' yeast should be given three times a day to cover subclinical deficiencies of other portions of the B complex which might be present.

Archives of Internal Medicine, Chicago

72:709-814 (Dec.) 1943

*Recurrent Lymphocytic Choriomeningitis: Report of Case in Which Treatment Was with Pooled Normal Adult Serum. J. V. Treusch, A. Milzer and S. O. Levinson.—p. 709.
Effect of Roentgen Therapy on the Heart: Clinical Study. J. E. Leach. —p. 715.
Clinical Significance of Glycogen Content of Liver. M. Korenberg. —p. 746.
*Cardiovascular Manifestations in Pernicious Anemia. J. B. Carter and E. F. Traut.—p. 757.
Hypertension in Only One of Identical Twins: Report of Case, with Consideration of Psychosomatic Factors. M. Friedman and J. S. Kasanin.—p. 767.
Myocarditis in Bronchiectasis. O. Saphir.—p. 775.
Pernicious Anemia in Negroes. S. O. Schwartz and M. Gore.—p. 782.
Splenoportal Venous Obstruction Without Splenomegaly: Further Contribution to the Pathogenesis of Fibrocongestive Splenomegaly (Banti Syndrome). P. Ravenna.—p. 786.
Review of Neuropsychiatry for 1943. S. Cobb.—p. 795.

Lymphocytic Choriomeningitis Treated with Pooled Normal Serum.—Treusch and his collaborators report the clinical history of a student nurse aged 22 who had recurrent attacks of lymphocytic choriomeningitis. The virus was isolated from the spinal fluid obtained during the initial attack and again during the recrudescence. The patient subsequently had a strong concentration of both neutralizing and complement fixing antibodies for the choriomeningitis virus in her blood serum. The case showed several unusual clinical features, especially the clinical picture of an encephalomyelitis associated with absence of pleocytosis or other abnormal findings in the spinal fluid and an essentially afebrile course. Administration of pooled normal adult human serum in large amounts appeared effective in the control of both the first attack and the recrudescence of the disease. The presence of neutralizing antibodies against the virus of lymphocytic choriomeningitis was demonstrated in three of twelve random pools of normal adult human serum, while no complement fixing antibodies were detected.

Cardiovascular Manifestations in Pernicious Anemia.—Carter and Traut reviewed the histories of 300 authenticated cases of pernicious anemia from the standpoint of cardiovascular symptoms. There were 257 with and 43 without cardiovascular manifestations. In the presence of severe anemia it is impossible to segregate dependably patients with primary cardiovascular involvement. All the usual criteria of cardiovascular disease may occur solely as the result of anemia. These symptoms and findings are not restricted to any type of anemia or related to the severity of the anemia. Examination of the blood is essential for dependable differentiation. Cardiovascular manifestations often occur with hematologic decompensation and disappear after treatment or during a remission.

Archives of Ophthalmology, Chicago

30:585-706 (Nov.) 1943

Peripheral Retinal Holes Without Detachment. A. Knapp.—p. 585.
Carbaminoylcholine Chloride in Petrolatum. K. C. Swan.—p. 591.
Guides in the Operative (Cosmetic) Treatment of Nonaccommodative Concomitant Squint in Adults. H. S. Sugar.—p. 593.
Pupillary Reflex to Darkness. O. Lowenstein and I. Givner.—p. 603.
Genetic Studies on Ectopia Lentis: A Pedigree of Simple Ectopia of Lens. H. F. Falls and C. W. Cotterman.—p. 610.
Electrophoretic Studies on Serums of Patients with Ocular Disturbances. J. Bellows, J. Cooper and H. B. Bull.—p. 621.
New Ophthalmologic Impression Material. T. E. Obrig.—p. 626.
Effect of Sulfonamide Ointment on Healing of Experimental Wounds of Rabbit Cornea. C. Berens, P. F. de Gara and M. Loutfallah.—p. 631.
Influence of Prolonged Wearing of Meridional Size Lenses on Spatial Localization. H. M. Burian.—p. 645.
Visual Impairment During Tryparsamide Therapy. W. B. Potter. —p. 669.

Archives of Pathology, Chicago

36:539-646 (Dec.) 1943

Diaphragm and Diaphragmatic Hernia. J. L. Bremer.—p. 539.
*Autopsy Study of Cerebral Malaria with Special Reference to Malarial Granuloma. R. G. Dhayagude and N. M. Purandare.—p. 550.
Spontaneous and Experimental Encephalitozoon Infection in Laboratory Animals. T. L. Perrin.—p. 559.
Toxoplasma and Encephalitozoon in Spontaneous and in Experimental Infections of Animals: Comparative Study. T. L. Perrin.—p. 568.
Erosive (Mycotic) Aneurysm of Heart with Rupture. C. L. Pirani. —p. 579.
Mechanism of Release of Colloid and Significance of Specific Crystalline Substance Demonstrated in Thyroid Gland Histologically. N. W. Popoff.—p. 587.
Acquired Bicuspid Aortic Valve with Obliteration of the Commissural Raphe. S. Koletsky.—p. 602.
Abdominal Visceral Lesions Associated with Primary Disease of Liver. A. D. Pollack and I. E. Gerber.—p. 608.
Experimental Atherosclerosis: V. Effect of Testosterone Propionate and Estradiol Dipropionate on Cholesterol Content of Blood and Aorta in Castrate Female Rabbits. M. Bruger, I. S. Wright and J. Wiland.—p. 612.
Neuropathology of Malnutrition Associated with Prolonged Alcoholism. I. M. Scheinker and C. D. Aring.—p. 615.
Diverticula of Colon in Rats Fed a High Fat Diet. J. L. Wierda. —p. 621.
Hodgkin's Disease: Incidence, Distribution, Nature and Possible Significance of Lymphogranulomatous Lesions in Bone Marrow, a Review with Original Data. P. E. Steiner.—p. 627.

Cerebral Malaria and Malarial Granuloma.—Dhayagude and Purandare secured in the course of fifteen years a record of 97 cases of malaria in which autopsies were performed. In 55 of these malarial parasites were found in the capillaries of the brain. They were diagnosed post mortem as cerebral malaria. Fever and coma were present in 28. Other symptoms were paresis of limbs, aphasia, dysentery, pneumonia, rigidity of the neck and exaggerated jerks. The condition was confused with meningitis. In all 55 cases malarial parasites were found on necropsy. The external appearance of the brain was abnormal in 43 cases. The fact that in the remaining 12 cases the external appearance was normal indicates the necessity of carrying out a microscopic examination of the brain before ruling out cerebral infection. The most common abnormal change was the slaty gray discoloration of the brain substance. Microscopic examinations of sections of the brain showed the capillaries to be filled with malarial parasites and their pigment. In 2 cases minute punctiform hemorrhages were noticed in the subcortical region. In 5 cases subcortical areas of focal necrosis were seen. There was no evidence of glial proliferation. In 10 cases malarial granuloma was present. A typical malarial granuloma exhibits three zones; the older granulomatous nodules do not show these three zones. In them a central capillary is surrounded by a mass of nuclei of the neuroglial cells with little of the necrotic material. Plasmodium falciparum was the infecting type of parasite in the cases in which granuloma was noted. In the year of the epidemic only 1 of 15 brains showed malarial granuloma. The reason probably is that granuloma, which indicates a neuroglial response, takes some time to be produced and in an epidemic the patients die quickly. It is easy to imagine that the described lesions would provide the pathologic basis for mental disturbances designated as malarial psychosis.

Archives of Surgery, Chicago

47:517-614 (Dec.) 1943

Cancer Associated with Acanthosis Nigricans: Review of Literature and Report of Case of Acanthosis Nigricans with Cancer of Breast. Helen Ollendorff Curth.—p. 517.
*Sickle Cell Disease with Special Regard to Its Nonanemic Variety. J. Bauer and L. J. Fisher.—p. 553.
Cutis Grafts: Application of Dermatome-Flap Method: Its Use in Case of Recurrent Incisional Hernia. S. A. Swenson Jr., and H. N. Harkins.—p. 564.
Penetrating Wounds of Heart: Routine of Management Based on Five Year Period of Personal Observation and on Five Personal Cases. H. Nelson.—p. 571.
Flexible Plastic-Liquid Adhesive. D. Rosenberg.—p. 583.
Progress in Orthopedic Surgery for 1942: Review Prepared by an Editorial Board of American Academy of Orthopaedic Surgeons: XI. Conditions Involving Spine and Thorax Exclusive of Those in Lower Part of Back. J. R. Cobb.—p. 586.

Nonanemic Variety of Sickle Cell Disease.—Bauer and Fisher report 7 cases of sickle cell disease which demonstrate various consequences of the constitutional sickle cell trait. Anemia is not an obligatory sign of sickle cell disease. Serious consequences may result from the circulatory stasis in the small

blood vessels rather than from the anemia. Anemia in sickle cell disease is explained as a consequence of the deterioration of the conglutinated distorted red blood cells that cause the circulatory stasis. Persons with the sickle cell trait are potential candidates for sickle cell disease with or without anemia. They are frequently representatives of a status degenerativus and are biologic liabilities. Many cases of sickle cell disease are not diagnosed correctly because the sickling phenomenon is not looked for. All Negro patients in both medical and surgical services should be tested routinely for sicklemia. This demand is particularly made with regard to the armed forces.

Bulletin of Johns Hopkins Hospital, Baltimore

73:307-400 (Nov.) 1943

*Successful Ligation of Left Common Iliac Vein for Thrombophlebitis Complicated by Pulmonary Emboli. R. T. Shackelford and R. Whitehill.—p. 307.
Pantothenic Acid Deficiency in Swine, with Particular Reference to Effects on Growth and on Alimentary Tract. M. W. Wintrobe, R. H. Follis Jr., R. Alcayaga, M. Paulson and S. Humphreys.—p. 313.
Antibacterial Properties of Crude Penicillin. A. M. Fisher.—p. 343.
Fungistatic and Fungicidal Effect of Sodium Propionate on Common Pathogens. E. L. Keeney, with technical assistance of E. J. Santora and G. German.—p. 379.
Guillain-Barré Syndrome (Acute Infective Polyneuritis) with Increased Intracranial Pressure and Papilledema: Report of 2 Cases. F. R. Ford and F. B. Walsh.—p. 391.

Ligation of the Iliac Vein for Thrombophlebitis and Pulmonary Emboli.—Shackelford and Whitehill maintain that the danger to life from thrombophlebitis arises from the development of pulmonary infarctions. A patient with a pulmonary infarction caused by an embolus from thrombophlebitis is in real danger to his life, and therapeutic measures may justifiably be radical. Neither heparin nor dicumarol was available to the authors. They believe that greater success can be archieved by surgical procedures which isolate the site of embolus formation from the general circulation. They report a case of thrombophlebitis and pulmonary embolism which occurred in a soldier aged 28. Recovery followed ligation of the left common iliac vein at the inferior vena cava. There was little edema of the left leg before or after the ligation. Ligation of a vein above the site of thrombophlebitis is the most effective procedure in the prevention of pulmonary infarction. It seems to be more logical than the administration of an anticoagulant. It does not supply the whole answer to the problem, because a large percentage of pulmonary emboli arising from thrombophlebitis give no signs or symptoms and are thus not known to exist. The use of venography may reduce this number. Also the use of anticoagulants postoperatively in patients known to be susceptible to the development of thrombophlebitis may decrease the frequency of thrombophlebitis.

Canadian Medical Association Journal, Montreal

49:455-552 (Dec.) 1943

British-American-Canadian Surgical Mission to U. S. S. R. W. Penfield.—p. 455.
*Effect of Plaster Bandages and Local Cooling on Hemoconcentration and Mortality Rate in Burns. E. A. Sellers and J. W. Willard.—p. 461.
*March Hemoglobinuria. R. A. Palmer and H. S. Mitchell.—p. 465.
Internal Derangements of Knee Joint in Canadian Army (Overseas). D. W. MacKenzie and J. A. MacFarlane.—p. 472.
Intravenous Novocain for Analgesia in Burns (Preliminary Report). R. A. Gordon.—p. 478.
Evacuation of Crete, 1941. M. McRitchie.—p. 481.
Gold Therapy in Rheumatoid Arthritis. J. W. Graham and A. A. Fletcher.—p. 483.
Psychosomatic Medicine and General Practitioner. G. H. Stevenson.—p. 488.
Acute (Febrile) Polyarthritis in Army. G. C. Ferguson.—p. 492.
Conservative Treatment of Sinusitis in Children. G. E. Tremble.—p. 496.
Preliminary Study of Incidence of Intestinal Protozoa in Canadian Armed Forces. D. C. Bews and L. P. E. Choquette.—p. 501.
Antepartum Hemorrhage. H. B. Van Wyck.—p. 504.
Cancer of Larynx (With Observations on 103 Cases). A. A. Campbell.—p. 509.
Medical Classification of R. C. A. F. Groundcrew on Basis of Functional Requirements. F. A. L. Mathewson, D. R. Wilson, W. J. M. Cameron and B. F. Crocker.—p. 512.

Effect of Plaster Bandages and Local Cooling on Burns.—Sellers and Willard attempted to reduce local fluid loss in dogs after superficial burns by cooling and elevation of limbs. The animals were anesthetized with sodium pentobarbital and their legs were immersed in water at 100 C. for one minute. Hemoconcentration was followed by hourly hemoglobin and hematocrit readings. For the suspension and cooling experiment a 15 per cent burn was produced on the four legs of 4 dogs. Moistened gauze was loosely applied to the extremities. The limbs were then suspended and a current of air was directed over them. The body was well blanketed to conserve body heat. With a similar burn, using 11 control and 12 experimental animals, double walled rubber sleeves were applied to the four limbs, and water at 8 C. was circulated through the sleeving. A water pressure of from 5 to 20 mm. of mercury was developed within the envelop. Little hemoconcentration occurred in the animals treated by the immediate application of plaster. Of the untreated animals only 47.4 per cent survived, whereas of those that had been treated with plaster 94.5 per cent survived. The treated dogs showed no evidence of pain or discomfort after the effect of the anesthetic had passed off. When casts were removed after twenty-four hours the legs appeared normal, but soon blistering between the toes and swelling occurred in a manner similar to that of the controls. When the casts were removed after forty-eight hours some swelling occurred but never became prominent. Swelling was minimal after seventy-two hours. When the casts were removed after a longer period (up to eleven days) no swelling was observed, although the deep circulation was well maintained. When cooling was combined with a minimal pressure, as in the rubber sleeving experiment, a drop in skin temperature of 15 degrees C. was produced. The cooling with a varying pressure of from 5 to 20 mm. of mercury was continued for forty-eight hours; 9 of the 12 treated animals survived, and 4 of the 11 controls lived. A sustained light anesthesia was necessary during the entire period. When cooling was effected by passing a current of air over the moistened suspended limbs of the animals, 3 out of 4 dogs died. The most striking feature of these experiments is the reduction in mortality brought about by the immediate application of plaster bandages to burned extremities.

March Hemoglobinuria.—According to Palmer and Mitchell, march hemoglobinuria is a form of paroxysmal hemoglobinuria of unknown cause occurring in certain individuals after exertion in the erect posture. The appearance of blood stained urine is usually the only symptom, though in some cases there have been varying degrees of discomfort in the abdomen and lumbar region. Since early in 1940 there have been admitted to Canadian general hospitals overseas 4 cases of march hemoglobinuria in a total of over 75,000 admissions. Owing to its benign course, patients exhibiting the syndrome may not reach a hospital, and the incidence is probably greater than the figures would indicate. In an unselected group of 22 marathon runners Gilligan and Blumgart found 3 cases of frank hemoglobinuria and noted that 18 of the 22 men showed plasma hemoglobin values above normal at the end of a race. The authors report 2 cases of march hemoglobinuria, which were admitted in the last year. The pathogenesis of the syndrome is unknown, but a theory is advanced which suggests that the paroxysms are not due to increased hemolysis but to some unknown abnormality present during erect exertion interfering with the clearing from the plasma of the hemoglobin liberated in the normal destruction of senile erythrocytes.

Illinois Medical Journal, Chicago

84:349-402 (Dec.) 1943

Evaluation of Roentgen Studies in Heart Disease in Children. S. P. Ditkowsky and E. Rypins.—p. 367.
Sympathectomy in Treatment of Peripheral Vascular Diseases. G. de Takats.—p. 373.
Studies on Pathologic Physiology of Burns. H. Necheles and W. H. Olson.—p. 379.
The New "Illinois Mental Health Act." C. Sommer and H. H. Nierenberg.—p. 384.
*Treatment of Tetanus. L. Stern.—p. 387.
Torsion of Spermatic Cord with Unsuspected Testicular Tumor. J. H. Mohardt.—p. 389.
One Sided Spinal Anesthesia. D. L. Murphy.—p. 393.

Treatment of Tetanus.—Stern states that injection of antitetanic serum directly into the spinal cord of dogs arrests the development of tetanus, so that the animals recover fully and rapidly. Such favorable results are as a rule obtained only during the first twenty-four hours. A later application of this method frequently yielded less favorable results. The author

saved a patient with tetanus by injecting antitetanic serum into the spinal cord by the suboccipital route and simultaneously into the blood. Similar results were obtained with this method in other cases. The intraspinal injection of antitetanic serum proved effective in horses with tetanus. From 10 to 20 cc. of antitetanic serum should be injected into the spine, by the suboccipital route of patients with symptoms of tetanus after preliminary withdrawal of an equal amount of spinal fluid. These injections can be repeated several times. The simultaneous injection of antitetanic serum into the blood is aimed at rendering innocuous the toxin circulating in the blood.

Iowa State Medical Society Journal, Des Moines

33:543-586 (Dec.) 1943

Coronary Disease: Its Recognition and Management. H. L. Smith. —p. 543.
Use of Alloy Steel Wire as Suture Material. J. W. Dulin.—p. 546.
Extrarenal Azotemia Associated with Diabetic Acidosis. L. W. Swanson, L. E. January and O. D. Thatcher.—p. 548.

Journal of Infectious Diseases, Chicago

73:93-172 (Sept.-Oct.) 1943

Rectal Tuberculosis in Monkeys from Use of Contaminated Thermometers. J. T. Riordan.—p. 93.
Attenuation and Toxin Production of Diphtheria Bacillus: VII. Studies on Separation and Analysis of Products of Synthesis in Diphtheria Culture Filtrates. A. B. Wadsworth and Mary W. Wheeler.—p. 95.
Spectroscopic Investigation of Bacterial Toxins: II. Ultraviolet Absorption Spectrums and Fluorescence of Synthetic Products in Toxigenic and Nontoxigenic Diphtheria Cultures. A. B. Wadsworth and M. O'L. Crowe.—p. 106.
Avirulent Strains of Pasteurella Pestis. E. Jawetz and K. F. Meyer. —p. 124.
Sylvatic Plague Studies: IV. Inapparent, Latent Sylvatic Plague in Ground Squirrels in Central California. K. F. Meyer, R. Holdenried, A. L. Burroughs and E. Jawetz.—p. 144.
Effects of Inorganic Salts on Multiplication of Bacterial Viruses. H. Gest.—p. 167.
Experimental Clostridium Welchi Infection: I. Oral Sulfonamide Therapy (Sulfanilamide, Sulfapyridine, Sulfathiazole, Sulfadiazine). Lucile R. Hac and Mary Lou Eilert.—p. 167.

Journal of Lab. and Clinical Medicine, St. Louis

28:1775-1914 (Dec.) 1943

Production of Staphylococcus Antitoxin. J. B. Weaver, Mary Whelan Tyler and Doris K. Schuerman.—p. 1775.
*Human Plasma and Serum Toxicity. D. State and M. Levine.—p. 1786.
Effect of Sulfonamide Compounds on Antibody Response to Staphylococcus Toxoid. J. B. Weaver and Mary Whelan Tyler.—p. 1792.
Note on Cysts and Abscesses Induced in Rat by Injection of Oils. F. E. Emery and C. S. Matthews.—p. 1795.
Acute Dissecting Aortic Aneurysm: 2 Cases with an Antemortem Diagnosis in 1. S. L. Zimmerman.—p. 1799.
Explanation for Absence of Clotting in Bloody Cerebrospinal Fluid. M. J. Madonick and B. Newman.—p. 1809.
Thrombophlebitis Migrans. M. Y. Swirsky and C. Cassano.—p. 1812.
Artificial Phospholipid Membrane, Semipermeability and Blood-Brain Barrier. J. H. Weatherby.—p. 1817.
Studies on Detoxication of Organic Arsenical Compounds: IV. Protective Action of P-Aminobenzoic Acid Against Lethal Doses of Neoarsphenamine Without Inhibition of Trypanocidal Potency. J. H. Sandground and C. R. Hamilton.—p. 1821.
Absorption, Excretion and Distribution of Sulfamethazine (2-Sulfanilamido-4-6-Dimethylpyrimidine) in Man. J. K. Clark, F. D. Murphy and H. F. Flippin.—p. 1828.
Studies in Pharmacology of Mercury: III. Histochemical Demonstration and Differentiation of Metallic Mercury, Mercurous Mercury and Mercuric Mercury. W. C. Hand, B. B. Edwards and E. R. Caley.—p. 1835.

Human Plasma and Serum Toxicity.—State and Levine observed in the course of several thousand plasma transfusions at the University of Minnesota Hospitals reactions which called for a more detailed observation and experimentation. A group O patient developed chills, severe dyspnea and cyanosis following intravenous administration of 150 cc. of undiluted group A plasma. By all theoretical immunologic considerations this group A plasma should have been innocuous. This patient gave a positive skin test not only with the reacting plasma but also with three other group A plasmas and one AB plasma, but not with B or O plasmas. The patient was subsequently given 100 cc. of another group A plasma with resultant chills, cyanosis and dyspnea. Group O and group B plasmas given intravenously gave no reactions. The authors felt that dissolved A and B substances might be responsible for the phenomena described. They were able to obtain the purified A and B substances from Witebsky, and they used this material to check their hypothesis. Patients sensitive to the A or B plasma by skin tests with repeated A or B plasmas and some AB plasmas are also sensitive by skin test to the purified substance. These patients are also sensitive to group A or B plasma or AB plasma administered by the intravenous route. They have reactions following the intravenous administration of the purified A and B substances. Patients displaying sensitivity do not necessarily have an allergic history. The effect of pooling on the response to administration of the plasma in sensitive individuals was studied. It was found that pooling is not a sure method of preventing reactions. The authors also have evidence that reactions may occur because of factors other than the A and B substances. They feel that the following may be the cause of reactions when the A and B substances are not involved: 1. The presence of allergens in the plasma or serum. 2. The presence of reagins in the plasma or serum. 3. The presence of pyrogens. 4. The presence of immunologic factors as yet unknown. They present case histories to illustrate these causes. They found the skin test with the plasma a good method of indicating sensitivity to the plasma in many of the cases and an aid in preventing transfusion reactions.

Journal-Lancet, Minneapolis

63:383-432 (Dec.) 1943

Psychiatric Problem in War and Peace. J. C. McKinley.—p. 383.
*Guillain-Barré's Disease (Encephalomyeloradiculitis): Review of 33 Cases. A. B. Baker.—p. 384.
War and Peace Neuroses. W. G. Richards.—p. 398.
Convoy Fatigue and Traumatic War Neuroses in Seamen. D. Blain and Florence Powdermaker.—p. 402.
Employment of Mental Hygiene Principles in Improved Selection of Armed Forces. P. H. Heersema.—p. 405.
Neuropsychiatric Emergencies. P. K. Arzt.—p. 409.
Differentiation of Functional and Organic Neuropsychiatric Conditions. W. A. Carley.—p. 415.

Guillain-Barré's Disease.—According to Baker the symptom complex referred to as Guillain-Barré's syndrome has been recognized since 1892, when Osler first described it under the term of 'acute febrile polyneuritis." Since that time cases have been described under a variety of terms, such as radiculoneuritis, acute ascending paralysis, acute infective polyneuritis, infective neuronitis, polyneuritis with facial diplegia, myeloradiculitis, neuronitis, myeloradiculoneuritis and encephalomyeloradiculitis. Since this disease seems capable of involving almost any part of the nervous system and the resulting clinical symptoms are most variable, the differentiation from variants of already well known neurologic disorders is difficult. For the present it would be best to retain the term Guillain-Barré's disease. The characteristic features of this disease are (1) the rather sudden onset, occasionally preceded by some antecedent infection, chiefly of the respiratory passages, (2) the absence of those findings suggestive of a septic or toxic reaction in spite of the severe clinical symptomatology, (3) a cell-protein dissociation in the spinal fluid with a normal cell count and a high protein, (4) radicular involvement, (5) facial nerve palsy, (6) absence of mental symptoms even in the presence of a very severe illness and (7) a favorable prognosis, usually with fairly good functional recovery. The author reviews 33 cases of Guillain-Barré's disease, including 2 fatal ones in which complete postmortem examinations were obtained. The author differentiates five types, depending on the region of the nervous system most severely involved. These are (1) the abortive or mononeuritic, (2) the polyneuritic, (3) the myelitic, (4) the bulbar and (5) the cerebral types. The myelitic form is the most frequent, occurring in 45 per cent of the author's patients as compared to 24 per cent with mononeuritic symptoms and but 21 per cent with polyneuritic symptoms. Severe radicular pain and muscle tenderness, a normal or only slightly elevated temperature and leukocyte count, cell-protein dissociation in the spinal fluid, facial palsy and a favorable prognosis in spite of an apparently severe illness are the features which greatly aid in the diagnosis. In spite of the apparent optimistic outlook, follow-up studies of old patients indicate that neurologic residuals occur frequently. This disease occurs predominantly during the winter months, although scattered cases may be seen throughout the year. The histopathologic changes consist of

perivascular foci of demyelinization scattered throughout the cerebral hemispheres, neuronal alterations within the cranial nerve nuclei, and patchy areas of myelin destruction within the peripheral nerves. The perivascular distribution of the cerebral lesions suggest a hematogenous spread of the noxious agent.

Kansas Medical Society Journal, Topeka

44:397-428 (Dec.) 1943

Serious Gunshot Wound of Hip. M. E. Pusitz and R. M. Taylor. —p. 397.
"Screw Worm" Infestation of Ear. R. R. Melton and F. W. King. —p. 401.

Kentucky Medical Journal, Bowling Green

41:397-492 (Dec.) 1943

Minutes of Ninety-Third Annual Session of Kentuckly State Medical Association Held at Louisville October 5, 6, 1943.—p. 399.

Maine Medical Association Journal, Portland

34:231-252 (Dec.) 1943

Present Day Difficulties of Medical Practice and Licensure. A. P. Leighton.—p. 231.
Discussion of Section XI, Title IX, Social Security Act. A. G. Eustis.—p. 236.

Michigan State Medical Society Journal, Lansing

42:929-1022 (Dec.) 1943

Prognosis of Poliomyelitis and Treatment of Commonly Fatal Types. J. L. Wilson.—p. 955.
Sulfadiazine Agranulocytosis. R. A. Hettig and C. C. Sturgis.—p. 959.
Infections of Heart. R. F. Weyher.—p. 962.
*Anticoagulants—Heparin and Dicumarol. C. R. Lam.—p. 968.

Heparin and Dicumarol.—Lam presents results of four years' experience with heparin and dicumarol in the treatment of thromboembolic disease. The mode of action of the two substances differs. The administration of dicumarol does not result in an immediate effect on the clotting mechanism; about two days must pass before the supply of prothrombin on hand is used up. Heparin, on the other hand, acts immediately on the whole preformed supply, inactivating it for two to three hours when a single dose is administered. The author treated 71 patients with heparin, 56 of whom had pulmonary infarction. Other conditions treated with heparin included phlebitis, mesenteric thrombosis, arterial thrombosis of the leg, senile arterial occlusion and septic thrombophlebitis. Heparin was also used in arterial embolectomy and in ligation of the common carotid artery. Dicumarol was given by the author to 18 patients: to 11 with postoperative pulmonary infarct, to 3 with coronary occlusion and pulmonary infarct, to 1 with phlebitis and to 3 patients prophylactically after operation. The author concludes that these anticoagulants are of value in the prophylaxis of pulmonary embolism and in arterial surgery, phlebitis, mesenteric thrombosis and other conditions in which it is desirable to inhibit intravascular clotting.

New England Journal of Medicine, Boston

229:737-766 (Nov. 11) 1943

Endocrine and Pseudoendocrine Problems in Childhood. R. Wagner. —p. 737.
Functional Urinary Incontinence in Women: Report of 23 Cases Treated by Kennedy Operation. L. E. Phaneuf, R. J. Heffernan and S. C. Kasdon.—p. 743.
Actinomycosis of Chest with Spread to Abdomen: Report of Case Cured with Sulfadiazine. W. E. Ladd and A. H. Bill Jr.—p. 748.
Plasma Proteins: Their Importance in Clinical Medicine and Surgery. C. A. Janeway.—p. 751.

229:767-798 (Nov. 18) 1943

Medical Profession's Responsibility in Prevention of Blindness. H. B. C. Riemer.—p. 767.
*Therapeutic Value of Testosterone Propionate in Angina Pectoris. S. A. Levine and W. B. Likoff.—p. 770.
Treatment of Rheumatoid Arthritis with Gold. A. Cohen and A. W. Dubbs.—p. 773.
Plasma Proteins: Their Importance in Clinical Medicine and Surgery (concluded). C. A. Janeway.—p. 779.

Testosterone Propionate in Angina Pectoris.—Testosterone propionate in doses of 25 mg. was given three times weekly to 18 patients with typical angina pectoris for four weeks and to 1 patient for seven weeks. All but 2 patients received no other medication and continued the daily routine to which they had been accustomed. Of the 19 patients, 9 were hypertensive and 1 had rheumatic aortic stenosis and insufficiency. Five had had a previous coronary occlusion. Results were judged by the amount of physical activity necessary to produce an attack of angina and the number of glyceryl trinitrate tablets used daily. Five were much improved at the conclusion of the treatment. Two reverted to their former clinical state within six to eight weeks, 1 obtained no relief from a second series of injections after fifteen months of comparative comfort, and 1 has been followed for only one month. One patient was moderately improved, 2 were questionably improved and the remaining 11 obtained no benefit. No change in the blood pressure or electrocardiogram and no toxic effects were noted. Testosterone propionate does not appear to have any beneficial therapeutic effect in this disease.

229:799-854 (Nov. 25) 1943

*Blood Pressure Determinations in Patients with Essential Hypertension: III. Evaluation of Sympathectomy Over a Three Year to Five Year Period. D. Ayman and A. D. Goldshine.—p. 799.
Socioeconomic Aspects of Disease: Community Study of Pulmonary Tuberculosis in Selectees. R. W. Hyde and D. Zacks, with assistance of L. V. Kingsley.—p. 811.
Treatment of Thermal Burns: I. General Outline. National Research Council.—p. 817.

Sympathectomy in Hypertension.—Ayman and Goldshine present a small series of patients with essential hypertension who have undergone a variety of sympathetic denervations and who have had the advantage of detailed controlled study. The controls consisted of special clinic study of the blood pressure, together with home blood pressure determinations by the patients themselves. These data lead to the conclusion that sympathectomy is the first therapy of essential hypertension that has been shown to produce in some cases a definite prolonged nontoxic lowering of the blood pressure. With this improvement in blood pressure the heart may gradually decrease in size, the electrocardiogram return to normal, the symptoms disappear and the incapacity be replaced by normal activity lasting at least five years. Angina pectoris may disappear. Successful sympathectomy did not result in constantly normal blood pressure levels in any case. Grade 4 patients did not respond regardless of the extent of the sympathectomy. Success was more constant in patients subjected to extensive denervation. The transdiaphragmatic type of splanchnicectomy with dorsolumbar ganglionectomy was the most effective. Some failures are only apparently so when judged by the standard clinic readings, whereas the home blood pressure method reveals real improvement. Therapy by sympathectomy should be considered in patients with essential hypertension in whom progressive elevation of the blood pressure is found or in whom beginning vascular damage is demonstrated. Control figures of blood pressure levels and variations should be secured, preferably in the ambulatory state. Brief periods of preoperative hospitalization do not afford proper data with which to compare postoperative results. In a disease that has existed for some years there is rarely an excuse for brief preoperative studies or emergency decisions.

New York State Journal of Medicine, New York

43:2239-2350 (Dec. 1) 1943

Surgical Treatment of Plastic Induration of Penis (Peyronie's Disease). O. S. Lowsley.—p. 2273.
Reconstruction Following Complete Avulsion of Skin of Penis and Scrotum: Report of Case. L. E. Sutton.—p. 2279.
Eczema Vaccinatum: Report of Case. F. C. Combes and H. T. Behrman.—p. 2283.
Variations in Response of Diabetes to Insulin Therapy: Clinical Guides to Therapy. M. B. Handelsman.—p. 2287.
*Disparity in Blood Pressures in Both Arms in Normals and Hypertensives and Its Clinical Significance: Study of 1,000 Normals and 272 Hypertensives. B. Amsterdam and A. L. Amsterdam.—p. 2294.
Study of Cellular Respiration in Vivo with Spectroreductometer and Some Hormonal Observations. L. Berman.—p. 2301.

Disparity in Blood Pressures in Both Arms.—The Amsterdams recorded bilateral blood pressure readings in 1,000 individuals with an apparently normal cardiovascular system and in 272 hypertensive patients. They detected disparities between both arms in 76.4 per cent of the normal persons and in 89.3 per cent of the patients with hypertension. The right brachial systolic blood pressure was higher than the left in

70 per cent of normal persons and in 84.4 per cent of hypertensive patients. In only 6.4 per cent of normal and 4.9 per cent of hypertensive persons was the left brachial systolic pressure higher than the right. Fifty-one per cent of all hypertensive patients had disparities between both arms ranging from 20 to 50 mm. of mercury. In the small number of cases in which the left brachial systolic pressure was greater than that of the right, the disparity was invariably a small one. Diastolic blood pressure disparities occurred in normal and hypertensive persons but to a much lesser degree than systolic differences. These blood pressure disparities were found in both sexes and in all adult age groups, with a tendency toward a slightly greater increment in each successive decade. The degree of blood pressure disparity in hypertensive patients roughly increases with the degree of hypertension from an average disparity of 16 mm. of mercury in pressures of 150 to 170 mm. to an average of 41.6 mm. in those with blood pressures of 230 mm. and over. Significant and at times amazing systolic pressure disparities between both arms are common and should dispel the long-standing clinical fallacy of regarding such differences as strongly indicative of aortic aneurysm. A knowledge of these differences is of great importance in the standardization, diagnosis and prognosis of blood pressure abnormalities. The importance of routinely recording all blood pressure observations on both arms, using the right as the standard, cannot be overemphasized. The cause for such blood pressure disparities between both arms in normal persons is usually inherent in the anatomy and dynamics of the aortic arch and its branches.

North Carolina Medical Journal, Winston-Salem

4:497-536 (Dec.) 1943

Some Rhinolaryngologic Tumors of Unusual Clinical Interest: Small Series Presenting Infrequent Character, Difficulty in Management or Both. V. K. Hart.—p. 497.
Can Organized Medicine Alone Stay the Tide Toward Socialized Medicine? N. T. Ennett.—p. 507.
*Acidosis in Newly Born Infants. R. B. Lawson and W. L. Venning Jr. —p. 510.
Unsuspected Prevalence of Intestinal Parasites in North Carolina. W. N. Sisk.—p. 513.
"De Humani Corporis Fabrica" (1543-1943). J. C. Trent.—p. 517.
Approved Laboratories in North Carolina. Nell Hirschberg.—p. 519.

Acidosis in Newborn.—Lawson and Venning believe that closer regard to the acid-base balance in newborn infants will be rewarded by a reduction of neonatal deaths, many of which are now recognized to be due to acidosis. Normal infants during the first few days of life have a relatively low carbon dioxide combining power—the so-called acidosis of the newborn. It resembles closely the change of acid-base balance associated with fasting and dehydration, being essentially a relative increase of organic acids and a decrease in the carbon dioxide content of the blood. The average infant, with the onset of a regular and adequate intake of milk, adjusts this abnormality over a period of days. Of the 7 infants who are the subject of this report 4 may be classed as "premature" or "immature" as regards their weight. These infants had the lowest carbon dioxide combining powers. The clinical picture of acidosis in newborn infants is not that typically seen in older children. The typical Kussmaul type of breathing is not present. There may be merely rapid, shallow respirations. The diagnosis of acidosis may be suggested instead by failure to gain weight, listlessness or resistant dehydration. The use of isotonic solution of sodium chloride, even when repeated, apparently is not enough to bring an infant out of acidosis or to prevent its occurrence. Sixth molar sodium lactate solution will result in prompt and dramatic clinical improvement. Before sodium lactate solution is given, calcium should be administered in order to prevent the occurrence of tetany. It must be recognized that, particularly in premature infants, severe acidosis may occur after several days or weeks of apparent thriving.

Northwest Medicine, Seattle

42:345-378 (Dec.) 1943

Malingery in Relation to Psychopathy in Military Psychiatry. M. M. Campbell.—p. 349.
Industrial Medical Relationships. O. J. Johnson.—p. 354.
Industrial Hygiene in Washington. L. M. Farner.—p. 358.
Amebiasis and Related Infections. E. C. Faust.—p. 360.
Thirty Cases of Peptic Ulcer. L. E. Jackson and D. Metheny.—p. 367.
Carcinoma of Breast in Male. W. A. Niethammer and W. B. Dublin. —p. 368.

Public Health Reports, Washington, D. C.

58:1701-1728 (Nov. 19) 1943

Effect of Topically Applied Sodium Fluoride on Dental Caries Experience. J. W. Knutson and W. D. Armstrong.—p. 1701.
Identification of First Stage Larvae of Puerto Rican Anopheles. H. D. Pratt.—p. 1715.

War Medicine, Chicago

4:549-658 (Dec.) 1943

Dengue: Observations on Disease as Seen in South Pacific Area. J. R. Cavanagh.—p. 549.
Pentothal Sodium Anesthesia in Neurologic Surgery. B. Woodhall, with technical assistance of Elizabeth Goodman.—p. 556.
Hypnosis in Treatment of Neuroses Due to War and to Other Causes. C. Fisher.—p. 565.
Physical Treatments of Acute Psychiatric States in War. W. Sargant. —p. 577.
Manual of Emergency Treatment for Acute War Neuroses. L. S. Kubie. —p. 582.
Management of Meningococcic Infections at Station Hospital, Fort Benning, Georgia. L. Ochs Jr. and M. Peters.—p. 599.
Hysterical Homonymous Hemianopsia with Hemiplegia and Hemianesthesia. S. G. Stewart, G. C. Randall and F. Regis Riesenman.—p. 606.
*Improvement of Visual and Other Functions by Cold Hip Baths. A. H. Steinhaus and A. Kelso, with technical assistance of V. Reinhardt. —p. 610.
Minnesota Multiphasic Personality Inventory: Evaluation of Its Usefulness in Psychiatric Service of Station Hospital. C. W. Leverenz. —p. 618.

Improvement of Visual Function by Cold Hip Baths.—Steinhaus and his collaborators report observations on cold hip baths given to 47 men ranging in age from 17 to 45 years. Shortly after breakfast the subjects were given a series of tests. On experimental days the cold hip bath followed immediately. About two and one-half hours later the tests were repeated. On control days tests were given on the same time schedule without a bath. The self-administered hip bath is taken seated with the feet on a second stool, the thighs and legs being flexed. From a shower head connected by a flexible hose to a mixer valve, the lower part of the abdomen (umbilicus to groin) is sprayed three to five minutes with increasingly hotter water followed by a gradual change to tap coldness (45 to 65 F.) maintained five to fifteen minutes. Over-all time does not exceed twenty minutes. Each subject's comfort dictates the extremes of temperature and the speed of change. Symptoms of slight cramps or discomfort terminate the cold period. The tests concerned particularly the effects on the visual function. Telebinocular test cards were used to test visual efficiency, visual acuity, lateral muscle balance, perception of depth or stereopsis and critical fusion frequency. The effect on the psychomotor functions was tested by determining the number of taps which a subject could make on a telegraph key in ten seconds. The average of five such trials separated by fifteen second rest periods was taken as the performance. Reaction time was determined on equipment designed to test the reactions of drivers of automobiles. Physiologic changes were determined on 2 subjects for a total of six control and four bath days. Diastolic blood pressure rose consistently 6 to 10 mm. of mercury during the cold bath and remained elevated through the second test. The hematocrit showed a 2 to 3 per cent increase in volume of red cells. The other tests showed no significant changes. Observations for six to eight hours after the bath revealed in all observed persons a gradual return to prebath levels. The favorable effects persisted for at least six hours when no meal was taken in the interim. The authors never observed a "pay-off" period. A period of depression immediately following the bath was noted occasionally after extra long cold hip baths. Regularly, feelings of exhilaration were reported. Some subjects remarked that the visual field appeared brighter and that black objects looked blacker and white objects whiter. Ordinary over-all cold showers lasting two to three minutes occasionally produced a moderate improvement for a shorter time. Over-all showers of five minutes' duration were followed by depression of the functions studied. Apparently the greater loss of heat in an over-all shower more than offsets any advantages that may have been gained from the stimulation. The authors think that the effects of the cold hip baths are of sufficient significance to warrant their application in industry and in certain aspects of warfare.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Tuberculosis, London

37:101-132 (July-Oct.) 1943

Thoracic Injuries: Role of General Surgeon in Forward Area. C. P. Thomas.—p. 103.
*Smallpox Vaccination and Pulmonary Tuberculosis. R. Y. Keers and P. Steen.—p. 111.
Bronchogenic Neoplasm in Boy of Ten. R. Jones, K. W. MacKenzie and E. Biddle.—p. 113.
Pneumoperitoneum Combined with Artificial Pneumothorax and Phrenic Paralysis. R. Y. Keers.—p. 116.
Polyserositis. H. Hannesson.—p. 117.
An Unusual Complication of Gold Therapy. B. G. Ridgen.—p. 126.

Smallpox Vaccination and Pulmonary Tuberculosis.—Keers and Steen describe an outbreak of smallpox in Glasgow in the summer of 1942 and later in the same year in Edinburgh and Fife. Many persons were vaccinated. Keers received requests from former patients of the sanatorium for advice as to whether, in view of their previous pulmonary infection, they should undergo vaccination. Those in Glasgow were advised to be vaccinated. As far as is known, none of those so advised suffered any ill effects. Later in the year 4 patients were admitted to the sanatorium, all of whom gave a history of vaccination followed almost immediately by the appearance of symptoms of pulmonary tuberculosis. It is impossible to draw any definite conclusion from isolated instances, but it would appear that there is sufficient evidence to justify the assumption that vaccination may cause a flare-up in a latent focus. The authors think that if the necessity for widespread vaccination should arise again it would be well to exercise special caution before submitting to vaccination patients with pulmonary tuberculosis.

Irish Journal of Medical Science, Dublin

214:551-582 (Oct.) 1943

Retinal Hemorrhage, with Special Reference to Its Sources and Distribution. A. J. Ballantyne.—p. 551.
Hyperventilation Syndrome. D. K. O'Donovan.—p. 564.
Malignant Disease of Ovary. T. Gallagher.—p. 573.

Lancet, London

2:625-656 (Nov. 20) 1943

Patulin in Common Cold: Collaborative Research on a Derivative of Penicillium Patulum Bainier: I. Introduction. H. Raistrick.—p. 625.
Id.: Biochemistry and Chemistry. J. H. Birkinshaw, S. E. Michael, A. Bracken and H. Raistrick.—p. 625.
Id.: Preliminary Trial in the Common Cold. W. E. Gye.—p. 630.
Id.: Biological Properties: Extended Trial in the Common Cold. W. A. Hopkins.—p. 631.
Id.: Statistical Note. Greenwood.—p. 634.
Interstitial Emphysema After Extraction of a Lower Molar. K. McFadyean.—p. 635.
Tuberculosis Survey at a Mental Hospital by Miniature Radiography. W. E. Snell, J. F. MacMahon and F. R. G. Heaf.—p. 636.

2:657-688 (Nov. 27) 1943

Excursus on Terminology of Statistical Experimentation. A. Wright.—p. 657.
Surgical Gleanings from the Middle East. N. J. Logie.—p. 658.
Relation of Lymphatic Glands to Immunity Against Tuberculosis. M. C. Wilkinson and R. J. R. Cureton.—p. 662.
Gunshot Wounds of Elbow Joint. St. J. D. Buxton.—p. 663.
Dust as Vehicle of Infection in Children's Wards. E. D. Hoare, J. R. O'Brien and A. G. Watkins.—p. 666.
*Nutritive Value of Nitrogenous Substances in Potato as Measured by Their Capacity to Support Growth in Young Rats. Harriette Chick and Margery E. M. Cutting.—p. 667.

Nutritive Value of Potato.—Chick and Cutting investigated the relative nutritive value of wheat and potatoes. On a dry weight basis there is little difference between the calorific values; but, whereas bread contains 33 per cent of moisture, potatoes contain 75 per cent, so that more than 2½ times the bulk of the latter is required to furnish the same amount of energy. As a source of vitamins, potatoes are superior to wheat. Their content of vitamin B_1, riboflavin and nicotinic acid is of the same order; but, whereas wheat is devoid of vitamin C, potatoes are an important source. The potato has been the poor man's protection against scurvy. The potato contains about half the amount of nitrogen present in wheat and about one-third to one-fourth the amount of protein. The value of a food as a source of nitrogen for the body's needs does not, however, depend only on the protein it contains, for the latter is broken down in the intestine, and from the constituent amino acids the body rebuilds its own proteins. Accordingly, if the foodstuff contains amino acids in addition to proteins, these have to be taken into account. The potato differs from the cereals in having about half of its nitrogenous substances in the simpler forms of amides, amino acids and purines. The value of the mixture of nitrogenous compounds in the potato for support of growth of young rats from the time of weaning was compared by the authors with those of wheat and of milk. The value of the nitrogenous substances in the potato for supporting growth of young rats was found somewhat greater than that of those in whole wheat. The nitrogenous substances of potato were found inferior in nutritive value to those of milk. A diet containing 9 per cent of tuberin, the soluble protein in potato juice, was equal in value to one containing 11 per cent of whole wheat protein but not equal to one containing 11 per cent of casein. Some portion of the non-protein nitrogenous substances in the potato complement the amino acids of its protein to produce a mixture of biologic value not less than that of the protein itself. The authors conclude that the mixture of nitrogenous substances in the potato has a value as high as that of wheat protein.

Medical Journal of Australia, Sydney

2:261-288 (Oct. 2) 1943

Desert Sores. J. Devine.—p. 261.
Treatment of War Injuries of Large Intestine. H. C. Barry.—p. 262.
*Postmortem Delivery of Living Child by Mid Forceps. T. D. Hughes.—p. 264.
Outbreak of Food Poisoning Due to Staphylococcus Aureus. C. B. Sangster and T. C. Constance.—p. 264.

Postmortem Delivery of a Living Child by Mid Forceps.—Hughes points out that postmortem deliveries reported in the literature were accomplished by cesarean section. He reports a case in which delivery was done by mid forceps nine to ten minutes after the mother had died. Death had taken place during the second stage of labor. A live child weighing 9 pounds 4 ounces (4,195 Gm.) was delivered without undue difficulty. The infant was pallid, but the fetal heart could be heard; oxygen was administered, the child's color improved and it cried without any further attempts at resuscitation and maintained a satisfactory condition thereafter.

2:289-308 (Oct .9) 1943

Medical Work in Its Varying Aspects and Life in General in North India. E. W. Gault.—p. 289.
*Epidemic of Polyarthritis in the Northern Territory. J. H. Halliday and J. P. Horan.—p. 293.

Epidemic of Polyarthritis.—Halliday and Horan report on 105 soldiers admitted to two army hospitals in the Northern Territory between Nov. 1, 1942 and Jan. 31, 1943. Over some months prior to this period, patients with acute arthritic manifestations had been admitted. It was felt that the condition was one which had not been previously described. The term "acute polyarthritis" was applied to this entity because the predominant signs and symptoms were related to joints. It is an acute febrile disease characterized by a fleeting exanthem, mild fever, pain and swelling of the joints and tender enlargement of the lymph nodes. The disease runs a benign course of from one to four weeks, and complete recovery takes place. The etiology is unknown. One of the most striking features is the absence of severe constitutional disturbance. The average leukocyte count was 10,000. In the acute type of the disease the sedimentation rate of the erythrocytes was almost invariably increased during the active phase and tended to fall as the symptoms subsided. Agglutination tests with Proteus OX19 and OX2 and Brucella abortus gave no significant results. Cultures from tonsils and nasopharynx produced no significant departure from normal. Culture study of urine and stools yielded no pathogens. Sigmoidoscopy in 6 cases revealed a normal mucosa. Since dengue fever is the chief endemic and epidemic disease in the region, the described disorder might be an atypical form of dengue.

However, the clinical picture of the present syndrome differs in many respects from dengue fever. Further evidence against the syndrome being an atypical form of dengue fever is obtained from a consideration of the geographic distribution. Cases of typical dengue occurred constantly throughout the period under review, but there was no increase in the number of these cases in December when this epidemic reached its height. Many of the cases of acute polyarthritis came from areas in which no typical dengue fever occurred. Rest in bed during the active phase of the disease is advisable. The affected joints do not require immobilization. Mild analgesics, particularly at night, are helpful. During convalescence active movements should be encouraged and the patient assured that these will hasten complete recovery.

Revista de la Asoc. Méd. Argentina, Buenos Aires

57:705-768 (Sept. 30) 1943. **Partial Index**

*Acute Amebiasis. J. M. Jorge, I. Goñi Moreno and A. R. Peralta. —p. 707.
Cardiac Hydatidosis. J. M. Jorge and P. M. Re.—p. 720.
Fractures of Head of Radius with Displaced Fragment. J. P. Reggi. —p. 740.
Arthrodesis for Paralysis of Deltoid Muscle: Personal Technic. J. Piñeiro Sorondo.—p. 746.
Littré Strangulated Diverticular Hernia and Peritonitis. A. Dujovich and M. Shraer.—p. 749.

Acute Amebiasis.—Jorge and his collaborators report a case of acute amebic abscess of the liver and acute peritonitis due to intestinal perforation. Emetine therapy and puncture of the abscess did not influence the course of the disease. A virulent vegetative hematophagic strain of Amoeba histolytica was identified in the pus, in the walls of the abscess from material taken at a necropsy and in the walls of small abscesses of the intestinal wall. This form of amebiasis is rare and is probably the result of association of a strain of ameba of increased virulence in the presence of local infection.

Revista Mexicana de Pediatría, México, D. F.

13:279-316 (Aug. 10) 1943. **Partial Index**

*Therapy of Noma. R. H. Valenzuela.—p. 310.

Therapy of Noma.—Valenzuela reports recoveries in 6 cases of acute and subacute noma following local application of sulfathiazole and blood transfusion. Sulfathiazole was applied locally three or four times daily after the tissues had been washed with warm diluted solution of sodium hypochlorite. Sulfapyridine was given by mouth in doses of from 0.1 to 0.2 Gm. per kilogram of body weight. Transfusion was given in doses of 10 and 20 cc. of blood for each kilogram of body weight at intervals of three or four days.

Semana Médica, Buenos Aires

50:1035-1090 (Nov. 4) 1943. **Partial Index**

*Bilateral Artificial Pneumothorax. C. A. Crivellari and C. A. Lamarque de Crivellari.—p. 1035.
Action of Bilateral Lumbar Sympathetic Anesthesia on Arterial Pressure. O. T. Grassi and S. E. Luchetti.—p. 1049.
Sulfanilamide in Pleurisy. E. Ferreira do Nascimento.—p. 1059.

Bilateral Pneumothorax.—Crivellari and Lamarque de Crivellari advocate a bilateral artificial pneumothorax for all types of acute and toxic pulmonary tuberculosis, provided the process is not hyperacute or hypertoxic. Extensive pulmonary lesions, cardiac weakness, increased sedimentation rate of the erythrocytes and pronounced diminution of the vital capacity constitute the contraindications. In patients with bilateral pulmonary tuberculosis, pneumothorax should be induced on the lung which shows the most recently developed lesions, provided the lesions of the opposite lung are subacute. Bilateral alternate pneumothorax is indicated in these cases if unilateral pneumothorax is not followed by partial spontaneous pneumothorax of the opposite lung and consequent healing of the lesions. Successive bilateral pneumothorax is indicated in bilateral involvement with collapse of the lung from unilateral pneumothorax. Simultaneous bilateral pneumothorax is indicated in bilateral tuberculosis with lesions of the same acuteness in the two lungs and when acute bilateralization appears in the course of unilateral pneumothorax. The course of bilateral pneumothorax is controlled by radioscopy. The most frequent complications of bilateral pneumothorax are (1) unilateral or bilateral fibrinous or purulent pleurisy, (2) spontaneous or operative pulmonary perforation, (3) appearance of new lesions in the collapsed lungs and (4) anoxemia. To prevent complications, it is suggested that (1) bilateral pneumothorax should be practiced only on hospitalized patients, (2) air insufflations should be performed separately, on different days, at proper intervals, (3) repeated determinations of the vital capacity or of the time of voluntary apnea should be a routine and (4) the treatment should be given in sanatoriums located in low lands or in places slightly above the sea level. The author obtained good results in 3 out of 4 cases thus treated.

Archiv für Kinderheilkunde, Stuttgart

127:97-136 (Nov. 27) 1942.

*Malignant Diphtheria Following Tonsillar Operations. G. Bonell. —p. 97.
Guillain-Barré's Syndrome During Childhood. M. Spira.—p. 103.
Paramorbillous Meningococcic Meningitis. T. Brehme.—p. 110.
Myeloid Reaction in Abdominal Tuberculosis During Childhood. A. Braun.—p. 118.
Serum Polyneuritis. J. Stoldt.—p. 129.

Malignant Diphtheria Following Tonsil Operations.—Bonell reports 4 cases of diphtheria that developed after operations on the tonsils. Three of the cases terminated in death. Three possibilities are suggested: 1. The children may have been in the incubation period of diphtheria and would have developed the disease even if they had not undergone the operation. 2. The removal of the adenoids or of the palatine tonsils had an unfavorable effect on the course of the diphtheria; it is possible also that the children were contact carriers of diphtheria bacilli and the operation produced the conditions for the pathogenic action of previously harmless pharyngeal saprophytes. 3. The diphtheria bacilli may have entered the pharynx after the operation. Every nasal or pharyngeal operation should be preceded by examining a smear for the presence of diphtheria bacilli. If such bacilli are found, the operation should be postponed until after active immunization has been carried out.

Zentralblatt für Chirurgie, Leipzig

69:1009-1056 (June 20) 1942. **Partial Index**

Appendectomy and Cecum Mobile. V. Schmieden.—p. 1013.
Treatment of Uterine Strictures and Fistulas by Means of T Drain. O. Nordmann.—p. 1015.
Bone Cyst of Temporal Region as Metastasis of Cystic Adamantinoma of Lower Jaw: Remarks on Pathogenesis. H. Coenen.—p. 1020.
Resection of Kidneys. A. W. Fischer.—p. 1026.
Traumatic Hydronephrosis as Sequel of Skipole Injury. E. Ruppanner.—p. 1030.
Surgical Technic for Removal of Renal Calculi. H. Boeminghaus. —p. 1034.
*Indications for Electroresection in Hypertrophy of Prostate. C. H. Schröder.—p. 1044.

Indications for Electroresection of Prostate.—Schröder practiced transurethral electroresection of the prostate in 230 cases during a period of nine years. The operation is indicated for a slight enlargement of the prostate, for median bar protrusions of an otherwise not greatly enlarged gland and in sclerosis of the sphincter or the neck of the bladder. In such cases electroresection produces favorable permanent results. Patients with moderate or great enlargements should be subjected to suprapubic prostatectomy when the general condition, renal function and other urinary functions permit this operation. Electroresection should be done in these types of hypertrophy if the renal function is inadequate, if stasis-induced damage exists or if the general condition or the circulatory or respiratory systems are impaired. In extreme cases of hypertrophy in which radical operation is no longer possible, correspondingly large amounts of tissue (25 to 45 Gm.) must be removed. This is readily accomplished by the Staehler-Heywalt apparatus, because the part of the gland to be resected is rendered bloodless by transurethral infiltration with epinephrine solution. For patients with pronounced hypertension, smaller doses of epinephrine should be used. In patients with urinary stasis the intervention should be carried out only after adequate preparatory treatment. The decision whether electroresection or suprapubic protastectomy should be done depends not only on the condition of the patient but also on the surgeon and on his expertness in electroresection.

Book Notices

A Synopsis of Clinical Syphilis. By James Kirby Howles, B.S., M.D., M.M.S., Professor of Dermatology and Syphilology, and Director of the Department, Louisiana State University School of Medicine, New Orleans. Fabrikoid. Price, $6. Pp. 671, with 123 illustrations. St. Louis: C. V. Mosby Company, 1943.

A celebrated British physician of a past generation once stated that he wrote a book on dermatology in order to learn more about the specialty. Incidentally, the book later ran through many editions. Perhaps Dr. Howles had this in mind in writing this book. There is no question of there being a place in the English literature for a concise, well written, well illustrated book on syphilis. This, however, is probably not the book. Some of its features are worth while, e. g. the chapter on organization of the syphilis clinic, including its social service aspects. Many other features give the reader the idea that it has been rushed through in a hurry, and, when that is done, errors are bound to creep in and the reviewer regrets to say that these are numerous throughout the book—so numerous that it is almost impossible to point them all out in a short review. One glaring fault that is noted throughout the book is the mentioning of different diseases in differential diagnosis and then either ignoring them or treating them in a very cursory manner. It may be worth while to point out some of the most obvious mistakes. On page 20 and in several other places the inference is given that syphilis may be carried from the father to the fetus with the mother escaping: "There are many instances in which the father has a demonstrably active syphilis but in which maternal syphilis cannot be demonstrated by any method, yet the child is born with all the stigmata of syphilis." Any syphilologist knows that such a mother, despite her negative serologic reaction, has a low grade type of syphilis. On page 27 it is stated that deliberate inoculations which would be necessary to prove the occurrence of superinfection in human subjects are obviously not practical. Despite Dr. Howles's statement, superinfection has been carried out in human beings by Japanese workers and there is one form of superinfection that is well known in syphilis—the contraction of a superinfected disease on top of a congenital syphilis. On page 36 the statement is made that "the great majority of multiple chancres arise from contact between an infected surface and an apposing surface." Any one who knows his syphilis knows that this is impossible. On page 51 the incorrect bacteriologic term is used for the bacillus Haemophilus Ducrey. On page 53 the improper term is used for lymphogranuloma venereum. And, in connection with this disease, as well as throughout the book, one notices the tendency to employ the word "gland" for "lymph node." Page 59, l'Hôpital Saint Louis is incorrectly spelled. On page 63 the statement is made that "death from acute secondary syphilis, which was not at all unusual in the prearsenical era, practically never occurs today." Nor was it seen very often in the prearsenical era would be the rejoinder of the reviewer.

Perhaps syphilis is different in New Orleans from what it is in other parts of the United States, but cutaneous Herxheimer reactions occur frequently in macular syphilis. On the other hand the neurosyphilid of Unna is an exceedingly rare entity of macular syphilis. Moreover, the illustration of a macular syphilid on page 67 looks more like a papulosquamous syphiloderm than a macular syphiloderm. The author included himself in a group with Fornier and Hutchinson in believing that there is a vesicular acquired syphiloderm. In fact, he would lead the reader to believe that it is rather common, with which we do not agree.

On page 90 the statement is made that "relapsing secondary lesions may be of any type but are usually macular (neurosyphilids of Unna)." Once more we would have to disagree. The neurosyphilid of Unna is an exceedingly rare entity. And once again, on page 93, we would disagree with the statement "Vesicular eruptions are uncommon in syphilis but are by no means rare in Negro subjects." On page 126 the advice is given that dark field examination may be of value in tertiary syphilis. The reviewer has never encountered spirochetes from dark field examinations in tertiary lesions. On page 163 under "Other Diagnostic Tests for Syphilis" a paragraph is devoted to the "spirochete complement fixation reaction" of Gaehtgens. This test is not generally used, and the reviewer would question the advisability of including this in such a small book devoted to the essentials of syphilis. The same would also apply to the dermoluetin test on the next page. Figure 59, on page 167, designed to show spirochetes in liver tissue, is worthless. On page 174 the statement is made that malignant precocious tertiarism is due to arsenical therapy having driven into the viscera the spirochetes which it did not kill. No mention is made of inadequate or irregular treatment as having anything to do with it. On page 225 the technic for bismuth injections is outlined. In the first place this technic is too time consuming, and in the second place it does not show the physician whether the needle has penetrated a blood vessel or not. Simply inserting a needle and watching it for thirty to sixty seconds to see if blood comes out would not always obviate emboli. No mention is made of the use of negative pressure by suction of the syringe attached to the needle.

When it comes to treatment of syphilis, the reviewer cannot agree with the author at all. Dr. Howles seems to have profound faith in the use of mercury, even in this day and age. In many of his forms of treatment therapy is begun with mercury. Even in acute syphilis, and even though the therapeutic index of mercury does not compare with that of bismuth or of arsenic, particularly of arsenic, he will depend on a course of mercury rubs rather than on the more potent bismuth injections between courses of arsenical therapy. Moreover, in late benign latent syphilis the author advises the use of arsenicals early, even though there would be danger of damage in the event of the patient having an uncomplicated syphilitic aortitis or a liver lesion. Likewise, his treatment of central nervous system syphilis does not agree with that of most workers. He does not seem to realize the value of fever therapy in these cases and, as far as malaria therapy is concerned, he apparently uses it but little; at least he knows nothing about the value of thiobismol to break the course of malaria therapy for a day or so in case of need. Why he recommends the use of silver arsphenamine in syphilis of the eye the reviewer does not know. On page 266, under "Syphilis of the Tongue—Primary Lesions," the statement is made that it may be difficult to identify the spirochete of syphilis on dark field examination, and biopsy or even culture of the organism may be necessary also. This is an incredible statement. On page 405 the statement is made that a spinal fluid may be considered normal as long as the total proteins are less than 60 mg. per hundred cubic centimeters. This statement is erroneous. Most textbooks feel that 30 up to 40 mg. per hundred cubic centimeters as a maximum would be normal. On page 433, treatment of optic atrophy, the advice is given for Swift-Ellis treatment weekly. Most physicians have given up the use of intraspinous therapy, and even the ones who do employ it do not employ it oftener than once in two weeks. On page 443 a short discussion is devoted to use of malaria in treatment of central nervous system syphilis. This discussion is very cursory, and the physician who desires some information with regard to the use of malaria would be disappointed with what he gets from this volume; e. g., during the chills the advice is given to take rectal temperature at two hour intervals. Furthermore, nothing is even mentioned about the necessity of frequent observations of the blood pressure during paroxysms. On page 536 the statement is made "Aortitis, aortic insufficiency, aortic regurgitation and even aneurysm may occur in congenital syphilis but are unusual, delayed manifestations, which many syphilitic children do not live long enough to develop." The reviewer disagrees entirely with this statement. These manifestations are practically never encountered in congenital syphilis. On page 585 is noted the statement that Noguchi in 1911 cultivated the spirochete of syphilis in vitro and reproduced the disease in experimental animals from the culture. As far as the reviewer knows, nobody has been able to cultivate a virulent Treponema pallidum that would reproduce the disease in experimental animals, e. g. rabbit testes.

The excerpts cited should indicate to the reader that this volume will require careful rewriting and revision before it will be a safe book to place in the hands of either medical students or physicians. It is not recommended in its present form.

Survey of Objective Studies of Psychoanalytic Concepts: A Report Prepared for the Committee on Social Adjustment. By Robert R. Sears, Professor of Child Psychology, Child Welfare Research Station, State University of Iowa, Iowa City. Bulletin 51. Paper. Price, $1.25. Pp. 156. New York: Social Science Research Council, 1943.

This report discusses studies in which effort has been made to verify certain of the psychoanalytic concepts and suggests a further program for research. Professor Sears points out that Freud, dealing with problems of therapy, necessarily had to proceed independently of experimental psychology in the construction of his theories. Only in recent years have objective technics been developed for studying some of the aspects of behavior in which Freud was interested. The report covers studies pertaining only to concepts derived from early freudian theory. Material relating to aggression has been excluded on the ground that Freud never formalized his theories of aggression in such a way as to give meaning to experimental data. Except for one study published in 1924 (The Passing of the Oedipus Complex) and reference to the 1933 edition of Freud's Introductory Lectures, all studies by Freud referred to dates earlier than 1916.

No attempt will here be made to review in detail the author's conclusions as to the extent to which psychoanalytic concepts are affirmed by objective studies. He emphasizes the great difficulties that exist in attempting to apply such "objective" methods to the study of the sort of things Freud studied. A typical example of such difficulty is that pointed out with reference to studies of childhood memories: "Recalls obtained in a classroom cannot be compared with those from the analytic couch or even from the quiet retrospection of a person who actively seeks his memories" (p. 109).

Sears feels that the objective studies support Freud's conception of infantile sexuality but not the relationship between erotogenic zones. The concepts of regression and fixation have been rather satisfactorily approachable through experimental animal psychology. Methods of investigation of learning are well developed. With respect to such mental mechanisms as repression and projection, nonanalytic methods merely demonstrate that these processes exist and can be measured. With respect to such mechanisms as inhibition, sublimation, reaction formation and projection, neither support nor refutation is derived from the objective studies.

This survey will be welcomed by all students of behavior, psychoanalyst and nonpsychoanalyst alike. Attempts to verify, test and disprove theories in any field are essential to development of the science. The author is obviously unable to say how much of psychoanalysis is "true." This is so because as yet there are no methods that permit "objective" scrutiny of many of the facts, or alleged facts, derived from psychoanalytic study. The author states that, by the criteria of the physical sciences, psychoanalysis is a bad science. This is obviously true, but by criteria appropriate to a science that investigates human behavior it may be the beginning of a good science. The author makes certain misstatements or, better, overstatements with respect to the unreliability of psychoanalytic observations. "Psychoanalysis relies upon technics that do not admit of the repetition of observation, that have no self-evident or denotative value, and that are tinctured to an unknown degree with the observer's own suggestions" (p. 133). The author overlooks efforts made to record psychoanalytic interviews accurately under conditions that permit comparisons between observations of different workers. Systematic further development of this procedure may go far to increase the reliability (from the standpoint of the objective investigator) of analytic observations. Correlation of psychologic observation with objective physical observation has been possible in appropriately conceived studies (e. g. Benedek and Rubenstein: The Sexual Cycle in Women, National Research Council, 1942).

The author concludes with suggestions for three types of research that give promise in the further development of a science of personality: longitudinal studies of growing personalities, further study of the influence of learning on motivation, and cross cultural comparative studies of personality development to help evaluate the social milieu as influence on determination of motivational and trait characteristics. He concludes finally that the social sciences "must gain as many hypotheses and intuitions as possible from psychoanalysis but that the further analysis of psychoanalytic concepts by nonpsychoanalytic technics may be relatively fruitless so long as those concepts rest in the framework of psychoanalysis." This sound statement should serve as a stimulus to psychoanalytic and nonpsychoanalytic investigators alike to press further testing of old theories and concepts and, where need be, their replacement by those more serviceable.

Skin Grafting of Burns: Primary Care, Treatment, Repair. By James Barrett Brown, M.D., Lieutenant Colonel, Medical Corps, Army of the United States, and Frank McDowell, M.D., Assistant in Clinical Surgery, Washington University, St. Louis, Missouri. Fabrikoid. Price, $5. Pp. 204, with 131 illustrations. Philadelphia, London & Montreal: J. B. Lippincott Company, 1943.

This manual, concerned chiefly with the late treatment of burns, is a timely and welcome addition to the already large literature on this important subject. The material consists of a clear, orderly and well illustrated description of the methods used in the author's service of plastic surgery at the Barnes Hospital. Only procedures and technics which have proved satisfactory in their large experience are given. No attempt is made to review the vast literature on the subject. The result is that an immense amount of valuable material is concentrated in a small volume, thereby making available to all surgeons explicit directions for treatment which can be easily followed. Much of the material heretofore has been available only in the original articles by the authors but now is assembled in this convenient form.

The first three chapters are devoted to the primary treatment of burns and shock and cover briefly the accepted present day treatment of recent burns. The several methods of local treatment, e. g. by means of pressure dressings, by closed or "sealing" methods and by tannic acid or dyes, are presented impartially. Following this is a chapter devoted to the pathologic physiology of the healing of tissues injured by heat.

The remainder and greater part of the book is given over to lucid and well illustrated descriptions of the use of the various types of skin grafts. The different grafts are considered individually, the indications and contraindications for their use given and the operative technic adequately described. Such matters as the preparation of the donor site, the optimum time for grafting, the postoperative care and dressings are considered in detail. A particularly valuable chapter is the one concerned with thick split-skin grafts, which have been popularized by the authors and which have proved so successful in their hands. The concluding chapters are concerned with some of the problems of reconstructive surgery for deformities in the several regions of the body, e. g. axillas, neck, extremities and face. Of especial interest at this time is the final chapter by Lieutenant Colonel Brown, which was written after he was called into military service and in which he recounts some of his experiences in the European theater of operations.

The authors are to be congratulated on having made available to the general profession the fruits of their large experience in the reconstructive surgery of burns and to have provided the excellent descriptions of technical problems in such a concise and easily understandable manner. This fund of information should be most welcome to surgeons in general and should prove a boon to the severely burned patient. Throughout the book the large number of excellent illustrations, consisting almost entirely of photographs of actual cases, adds immensely to the value of the book and enhances the clarity of the text. If any criticism of the book was to be made, it would be that the difficult art of skin grafting is made to appear extraordinarily simple and fool proof. The book should become one of the classic monographs on the subject of the treatment of burns.

The Epidemiology of Diphtheria During the Last Forty Years. By W. T. Russell. Medical Research Council Special Report Series No. 247. Paper. Price, 1s. Pp. 52, with 5 illustrations. London: His Majesty's Stationery Office, 1943.

Diphtheria mortality in England and Wales has declined only 60 per cent compared with 80 per cent in the United States. The significant decline in mortality under 5 years in ratio to that above 5 years among persons of the lower social grades in London is attributed to reduction in number of overcrowded areas and in size of families. There has occurred an age shift in the diphtheria mortality from preschool to school ages among the child population in London. This is due largely to the influence of the trend of the death rates in the lowest social

group. Prior to 1940 little was done with active immunization. Since 1940 the government has distributed the immunizing agent to all local authorities, and good progress has been made. By the end of 1942, 46.5 per cent of the child population under 15 in England and Wales had been immunized. Statistical evidence is presented to show that protective treatments have reduced the morbidity and the mortality from diphtheria in New York City and in Toronto. According to past experience, the disease had a periodicity of six years in New York and of four years in Toronto. On this basis there should have been epidemics in both cities between 1930 and 1940, but none have occurred.

Geriatric Medicine: Diagnosis and Management of Disease in the Aging and in the Aged. Edited by Edward J. Stieglitz, M.S., M.D., F.A.C.P., Consultant in Gerontology, National Institute of Health, Washington, D. C. Cloth. Price, $10. Pp. 887, with 187 illustrations. Philadelphia & London: W. B. Saunders Company, 1943.

The constant increase in the population of the aged has created the new specialty of medicine which concerns itself with persons of advanced years. The volume, which has been prepared under the editorship of Dr. Edward J. Stieglitz, consultant in gerontology in the National Institute of Health, includes contributions by many authors, appropriately classified in groups having to do with general considerations, the specific infective diseases, disorders of metabolism and disorders affecting various special systems of the body. Of special interest are chapters concerning physiologic and anatomic changes associated with normal aging and that on the mental changes of this period. Obviously disease as it occurs in the aged is modified by the inability of the tissues to respond as they do in youth, modified by the special physiologic conditions having to do with diet, exercise and similar factors of living. As in most other collective volumes the individual chapters vary greatly in the quality of their writing, the selection of the material and the extent to which the authors have made studies of the available periodical literature. However, all the contributors are men of known repute, of wide experience and therefore men who speak with authority. The book is a valuable reference and should be especially useful to the general practitioner, whose practice is likely to partake more and more of the aged.

Informe biodemográfico y epidemiológico de las Américas (Biostatistical and Epidemiological Report on the Americas). Rafael H. Martínez, Pan American Sanitary Bureau. Pub. No. 195. Paper. Pp. 84. Washington, D. C., 1943.

Utilizing the facilities of the Pan American Sanitary Bureau, the author makes available statistics concerning births, deaths, morbidity and infections in the American nations. Obviously the various nations differ as to the sufficiency and accuracy of the data. Although the tables begin with the year 1930, it is recognized that the data for more recent years are more nearly complete than for the earlier ones. The Pan American Sanitary Bureau has been aiding in this type of work since 1939. The incompleteness of registration causes the editor to issue a warning against accepting the data as wholly accurate for purposes of comparison. In some countries more than half of the total deaths reported are still classified under the heading of "unspecified or ill defined." With all of its insufficiencies, the book is nevertheless the most dependable source of the data discussed at present available.

Notable Contributors to the Knowledge of Syphilis. By Herman Goodman, B.S., M.D. Cloth. Price, $3. Pp. 144, with 143 illustrations. New York: Froben Press, 1943.

To the many volumes covering the history of the most protean disease comes this selection of brief biographic notes. It seems strange to find Gutenberg, inventor of the printing press, included, because textbooks on syphilis were the first books to be printed while the authors were still living. Christopher Columbus gets five pages, which he probably merits, but Cellini gets only five lines because he had syphilis himself in 1532. The mention of Daniel Turner fails to include his contribution on the condom as a method of prevention. By the time the twentieth century is reached the names become so numerous that there is no longer even a line for a biographic note.

Clinical Parasitology. By Charles Franklin Craig, M.D., M.A., F.A.C.S., and Ernest Carroll Faust, M.A., Ph.D., Professor of Parasitology in the Department of Tropical Medicine, Tulane University of Louisiana, New Orleans. Third edition. Cloth. Price, $9. Pp. 767, with 288 illustrations. Philadelphia: Lea & Febiger, 1943.

The prompt demand for the third edition of this widely useful clinical treatment of human parasitology is an index of its desirability and utility in these wartimes. Our military and naval forces face ecologic and climatic conditions exposing them to bodily invasion by parasites, especially in the tropics and in the multiplied personal contacts due to the exigencies of war. The return of convalescents and discharged veterans to civilian life at the close of the war will bring added hazards to this country, as in the case of the last war, because of carriers who may establish new centers of infection, especially of malaria and the dysenteries. This edition has been revised, expanded and brought up to date by a thoroughgoing revision of the text, especially in the fields of epidemiology and clinical medicine, and in the subject of arthropod vectors of disease. Forty new illustrations, four full page color plates and two clinical tables have been added. Practitioners and students of biology and medicine will find in this book a mine of detailed information on the morphology, life history, occurrence, distribution, pathology and treatment of the known animal parasites, protozoan, helminth and arthropod, of man.

A Medical Bibliography: A Check-List of Texts Illustrating the History of the Medical Sciences. By Fielding H. Garrison, M.D. Revised, with additions and annotations by Leslie T. Morton, Librarian, St. Thomas's Hospital Medical School, London. Cloth. Price, £2, 10s. Pp. 412. London: Grafton & Co., 1943.

Here is a check list of textbooks illustrating the history of medicine, most useful to libraries and persons working in the field of medical history. The work was first suggested to Fielding Garrison by Sir William Osler. The list appeared first in the Index Catalogue of the Library of the Surgeon General's Office. Later it was revised and republished in the Bulletin of the Institute of the History of Medicine, Baltimore, 1933. Now much has been added and deleted from that list and it is here made available in permanent form. Even this work, however, fails considerably in exhausting the field. There are but three references to works on the history of quackery, two German references and one Italian, whereas a bibliography of such works would include at least a score of essential titles. The works on the history of syphilis contain several notable omissions. There is a reference to the Vallery-Radot edition of the complete works of Pasteur but no reference to his "Life of Pasteur."

An Introduction to Foods and Nutrition. By Henry C. Sherman and Caroline Sherman Lanford. Cloth. Price, $2. Pp. 292, with 14 illustrations. New York: Macmillan Company, 1943.

The book presents in a well organized and understandable manner a great deal of practical information. This information is developed from a discussion of the nutritive elements of food in the early chapters to discussion of the foods themselves classed according to the popular grouping of basic food types. Many historical and comparative economic facts of interest are brought in. Nutritional information is presented here with little use of technical terms. The material is up to date, with chapters containing many suggestions on how to meet the problems of essential food shortages with judicious purchasing, care in preparing food and methods of home preservation. The reference sources with each chapter and the many tables of nutritive values of foods at the end of the book increase its worth as an excellent source of nutritional information for those who are interested in general aspects of foods and their consumption.

British Medicine and the Vienna School: Contacts and Parallels. By Max Neuburger, M.D., Ph.D., The Wellcome Historical Medical Museum, London. Cloth. Price, 10s. 6d. Pp. 134, with 13 illustrations. London: William Heinemann, Ltd., 1943.

In the middle decades of the nineteenth century, American and British doctors went to Vienna to complete their education. The present volume refers to the interchange of medical science between the British and Viennese schools with brief notes concerning many of the notable physicians of both nations. Especially celebrated were Rokitansky and Skoda and their pupils.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

MENTAL DISORDERS FOLLOWING SEVERE SOMATIC DISEASE

To the Editor:—**A married woman, aged 26, white, following operation for hyperthyroidism has suffered many postoperative complications, including tracheal obstruction, tracheotomy, hemorrhage from the tracheotomy site and, following sulfadiazine treatment, nephritis with high nonprotein nitrogen. There was a thyroid crisis two months before the operation. About two weeks after the operation the patient developed a paranoid psychosis from which she is still suffering, two months later. She has had prolonged insulin shock therapy by experienced physicians, with little improvement. She fails to recognize persons actually well known to her, thinks she is being hypnotized by persons and objects, frequently refuses food and has to be tube fed, believes everybody is checking up on her, and sometimes attacks attendants. Determination of the basal metabolic rate has not been made since the onset of these symptoms, but the formulas of Read and Gale indicate normal figures. She has not had thyroid treatment but only sedatives as necessary. Is there any new treatment for this complication of hyperthyroidism?** M.D., Puerto Rico.

ANSWER.—The mental reaction that patients show following a somatic disease is dependent on two main factors: (1) the previous psychologic integration of the patient and (2) the disturbance in cerebral function produced by the somatic illness. Frequently both factors are important and must be taken into consideration in treatment. The more unstable the personality integration of an individual the less intense must the organic factor be to produce a mental disorder.

The patient described had many complications which were sufficient to produce toxic damage to the brain. Some of her mental symptoms are suggestive of a type of mental disorder known as toxic psychosis (a picture of mental confusion and delirium following a somatic disease). The paranoid elements in her symptomatology are probably related to her personality dysfunction.

The treatment of this type of mental disorder depends on several physiologic and psychologic principles. First, absolute rest must be produced either by sedation or preferably by the use of continuous tubs. The environment must be made simple and familiar, so that orientation will not be too readily disturbed by the strange and unfamiliar. Then diet is important. A high carbohydrate, high vitamin diet supplemented by sodium chloride, iodine and calcium salts is essential to restore the loss induced by hyperthyroidism, particularly after a crisis. Concurrently the usual psychologic principles are utilized in dealing with delusions or affect reactions.

Most patients when treated in this manner will recover after several months. Some patients, particularly those who have been poorly integrated to begin with, will go on to develop a more chronic psychosis either of the affective group or of the trend reaction type.

In this case insulin shock therapy has already been given with little improvement. The regimen as outlined may be followed for about six months. If by that time the patient continues to show a paranoid reaction, electric shock convulsive therapy may be administered. This should be given by physicians experienced in the procedure and cognizant of the complications.

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DILUTION OF BLOOD WITH WATER

To the Editor:—**Will you please give me a method of detecting the dilution of blood with water.** James L. Robinson, M.D., Los Angeles.

ANSWER.—To determine the dilution of blood with water accurately, it would be necessary to have a sample of the original blood and water for comparison. If such controls are not available, the estimation could nevertheless be made approximately by assuming that the blood came from a normal person. Any of the normal constituents of blood which do not deteriorate in water could be used as a basis for such a test. For example, if blood is mixed with fresh water free of minerals, a chloride determination could be done and the ratio of the normal blood chloride to the chloride content of the sample would give the blood dilution. (This method could not be used, of course, for salt water.) In a similar manner the protein content of the sample could be determined by the Kjeldahl or any other suitable method as a basis for an estimate of the blood dilution, but this method will be useless if the water is contaminated with nitrogenous matter unless a blank is run on the water itself. Still another method would be to evaporate a portion of the sample to dryness and weigh the residue in order to determine the solid content.

The objections to the methods mentioned can be overcome by testing for hemoglobin, the specific constituent of blood. For example, the following simple method could be used: Mix 9 cc. of the sample with 1 cc. of normal hydrochloric acid and wait ten minutes or longer until the hemoglobin is converted to acid hematin. If the sample is turbid, clarify it by centrifugation or filtration, then match against a standard Newcomer disk in a colorimeter. If the acidified sample is too dark, prepare a suitable dilution with tenth normal hydrochloric acid, e. g. ten or one hundred times, and match this diluted sample in the colorimeter. If we consider 17 Gm. per hundred cubic centimeters to be the normal hemoglobin content of the blood (the normal value is lower in the case of a woman and varies with age), the dilution of blood in the unknown sample is calculated as follows:

$$\frac{\frac{17}{100}}{R} \times \frac{250}{D} \times \frac{9}{10}$$

In the formula, R represents the reading in the colorimeter; the factor 9/10 takes care of the original dilution of the sample with normal hydrochloric acid, while D is the further dilution made with tenth normal hydrochloric acid. The factor 250 represents the dilution of blood in the ordinary hemoglobin determination by the Newcomer method, namely 20 cu. mm. made up to 5 cc.

Still other methods could be devised. When only a rough estimate is needed, one may bear in mind, for example, that a 1:1,000 dilution of blood is clear and almost colorless, that this is the maximum dilution at which a foam persists when produced by blowing through with a pipet, and that a slight cloudiness appears on addition of nitric acid or on heating. Still higher dilutions of blood can be detected by the benzidine, reduced phenolphthalein or similar methods. These tests can also be done quantitatively with the aid of standard solutions of blood of known dilutions but have the disadvantage that they are not absolutely specific for blood.

RECURRENCE OF GALLSTONES AFTER CHOLECYSTOSTOMY

To the Editor:—**Twenty-five years ago at the age of 60 a patient had his gallbladder drained and many stones removed. He got along nicely except that he occasionally suffered what he termed indigestion. About two weeks ago he suffered severe pain over the gallbladder with vomiting. Five days later he entered the hospital and did well for three days. He then developed severe pain over the gallbladder. On examining him I could distinctly feel the grating of the stones in the gallbladder. One night his temperature was 105 F., but after he took 22 grains (1.4 Gm.) of sulfadiazine it fell to 100 F. in five hours. He was deeply jaundiced. The pain was controlled by ¼ grain (0.016 Gm.) of morphine every three hours when the pain was at its height. Enemas and laxatives were given. One night he involuntarily passed a greenish liquid stool and hundreds of small stones sized from a small pea to fine gravel. Did the vitamin K have anything to do with the passing of these stones?**

J. Louis Waldner, M.D., Loveland, Colo.

ANSWER.—In this case there was probably a recurrence of gallstones in the gallbladder after the cholecystostomy. The development of jaundice suggests also the presence of stones in the common bile duct. The attack of severe right upper quadrant pain, vomiting and high fever could well be due to the impaction of a stone in the cystic duct, acute gangrenous cholecystitis and rupture of the gallbladder. The passage of gallstones in the feces indicates that the rupture took place into the gastrointestinal tract and that a fistulous communication with the biliary tract is present. The most common site of such communications is between the gallbladder and the duodenum. Rupture with fistula formation has occurred between the common duct and the duodenum, the hepatic duct and the duodenum, the gallbladder and the stomach, the gallbladder and the transverse colon, and rarely the hepatic duct and the stomach. In many cases these communications can be demonstrated at fluoroscopy following a barium meal. The vitamin K had nothing to do with the passing of the stones.

SURGICAL MENOPAUSE AND CARDIAC ARRHYTHMIA

To the Editor:—A woman aged 37 was operated on four years ago for ovarian cysts. The left ovary and three fourths of the right ovary were removed. For a year she did well, then began having irregular menstrual periods with headaches, nausea and dizziness. The flow was scanty; there was no discharge between periods. Last year she began to have a definite cardiac arrhythmia with dyspnea and mild cyanosis on the slightest exertion. These attacks have no relation to the menstrual flow and, I would say, occur three or four times weekly. I have sent her through a well known clinic where she was checked over thoroughly as regards heart, blood pressure, electrocardiogram, basal metabolic rate, roentgen examination of the chest, kidney tests, Wassermann reaction and analysis of the blood. All were reported normal symptoms due to a surgical menopause. However, she was having no arrhythmia at the time the electrocardiogram was made. Estrogenic substance and diethylstilbestrol have not been effective. I have used digitalis (tincture in 5 drop doses) with no success and phenobarbital ¼ grain (0.05 Gm.) morning and night, which helps a little. She is not neurotic or nervous. Could such symptoms be entirely due to a surgical menopause. Might there be some organic cardiac change? What is the present idea of the value of high voltage x-ray exposures to terminate menstruation? Are they carcinogenic? Can you recommend anything from the meager picture I have given?

M.D., Oklahoma.

ANSWER.—It is virtually impossible to answer the queries specifically and dogmatically, as much important information is not available. For example, it is not stated whether the patient is married, single, widowed or divorced or whether she has had any children. Nor is the dosage of estrogenic or of diethylstilbestrol stated. The described symptoms could be ascribed to the hormonal imbalance of a surgical menopause. But this does not prove that they should be so considered. For too many years and in too many cases has the climacteric been blamed for symptoms not obviously secondary to organic disease. It has been and is such a convenient explanation.

Despite the definite statement that the patient "is not neurotic or nervous," the benefit derived from small doses of phenobarbital is definitely suggestive of some psychic factor in the etiology. Psychosomatic manifestations frequently produce syndromes similar to that described (Weiss, Edward, and English, O. S.: Psychosomatic Medicine, Philadelphia, W. B. Saunders Company, 1943). A brief, frank, tactful but searching inquiry into the patient's possible anxieties might prove most revealing and profitable in explaining the somatic manifestations.

High voltage roentgen therapy to suppress further the little remaining ovarian activity hardly seems indicated. If the symptoms are due to the surgical menopause, such irradiation is more likely to induce an exacerbation rather than an abatement of symptoms. The carcinogenic potentialities of deep pelvic irradiation are not definitely established. It is highly doubtful that, properly administered, such irradiation has induced neoplastic growth in human beings. Animal experimentation has yielded conflicting results. Menorrhagia is a more logical indication for such therapy than the present syndrome. Certainly, before concluding that hormonal imbalance is not responsible, one must be certain that adequate amounts of estrogenic substance have been administered. Perhaps larger doses would be wise, but of this one cannot be sure, for there is no statement as to how much has already been used.

The clinic study, though made at a time when arrhythmia was absent, pretty effectively rules out gross organic disease of the heart. It does not, however, prove absent impairment of functional reserves, which can be accomplished only by the application of stress test procedures. For example, electrocardiographic study before and after exertion, the renal response to relative dehydration (concentration test) and a dextrose tolerance test. Acute episodes of hypoglycemia are a distinctly possible explanation of her acute attacks.

Not infrequently premenstrual intoxication, due to accumulation of the menstrual toxin (Macht, D. I.: *Am. J. M. Sc.* **206**:281 [Sept.] 1943) is distinctly increased by scantiness of flow. This premenstrual intoxication usually responds well to the administration of acidifying salts for ten days prior to expected menstruation; 3 to 5 Gm. daily of ammonium nitrate, ammonium chloride or calcium chloride, all available in 0.5 Gm. enteric coated tablets, are often extremely effective. There is certainly no hazard in a trial of such medication as long as a liberal fluid intake is insisted on.

A last possibility is that the vagal and vasomotor phenomena are the expressions of an atypical migraine (Stieglitz, E. J.: *Am. J. M. Sc.* **189**:359 [March] 1935). Paroxysmal tachycardia and, less frequently, arrhythmia due to premature concontractions are sometimes cardiac equivalents of the classic migraine attacks with hemicranic cephalalgia, scintillating scotomas, nausea and vomiting. A search for migraine in the family history and in the past history of this patient is certainly indicated. Such episodes are most commonly precipitated by exposure to food allergens of fatigue. Evidence of other allergic reactions in the patient would increase one's suspicions in this direction.

The patient is deserving of further diagnostic study before much more therapeutic experimentation should be attempted.

BLEEDING FOLLOWING APPLICATION OF SULFONAMIDES TO OPEN WOUNDS

To the Editor:—In recent applications of powdered sulfanilamide and sulfathiazole on open wounds with any surface, I have found that it caused excessive bleeding. Can you give me any information on the cause for such bleeding?

Orville J. Lighthizer, M.D., Ashtabula, Ohio.

ANSWER.—The observation that the application of powdered sulfanilamide and sulfathiazole to surface wounds is followed by excessive bleeding has not been mentioned in the literature by others who have carried out the same procedure. Possibly such a sequence of events might arise if an excessive amount of the sulfonamides should be placed in a surface wound. Under this condition the drug would act as a foreign body interfering with the usual physiologic mechanisms, such as clot retraction. But there is no known specific action of the sulfonamides that would cause bleeding. Thrombocytopenic purpura is a rare toxic complication resulting from sulfonamide therapy. Under such a circumstance one might anticipate excessive bleeding in the wound, but probably there would also be evidence of hemorrhage elsewhere. In general, not more than 0.1 Gm. of sulfonamide per square inch should be implanted into a wound or applied to a surface area. Furthermore, sulfonamides should not be applied repeatedly to surface wounds. Such a practice often results in an avascular and poorly granulating tissue.

It is of interest that sulfapyridine has been stated to exert a hemostatic effect when applied to experimental wounds, and to oozing surfaces following tonsillectomy (Cunningham, B. P.: *Ann. Otol., Rhin. & Laryng.* **51**:301 [June] 1942).

CONCURRENT ADMINISTRATION OF SULFUR DERIVATIVES AND SULFONAMIDES

To the Editor:—When sulfanilamide was introduced there was considerable publicity given to the contraindication of sulfonamides administered along with sulfur containing medicines. Since then this contraindication of sulfur and the sulfonamides has not been emphasized and other sulfonamides have largely superseded sulfanilamide. Is there a contraindication to the use of epsom salt or similar compounds with sulfadiazine? Is there a contraindication to intravenous injection of calcium thiosulfate along with the oral administration of sulfadiazine?

M.D., Florida.

ANSWER.—It is true that the earlier literature on sulfanilamide unduly emphasized the danger of sulfhemoglobinemia. It was presumed that the simultaneous administration of sulfanilamide and substances containing sulfur might lead to the formation of sulfhemoglobin. Epsom salt was particularly disfavored because its physiologic action was one of purgation followed by constipation, and during the ensuing period of constipation absorption of sulfates was most likely to occur. However, subsequent clinical investigations revealed that in practically all instances of cyanosis which resulted from the administration of sulfanilamide methemoglobin was present in the circulating blood, and only in extremely rare cases was an appreciable degree of sulfhemoglobinemia detected. It was further observed that cyanosis was less likely to occur following the use of the other available derivatives of sulfanilamide.

At the present time there is no contraindication for using foods or drugs containing sulfur along with sulfanilamide or any other available sulfonamide. There is no contraindication per se to the administration of epsom salt or similar compounds with sulfadiazine. Calcium thiosulfate should not be contraindicated for intravenous use when sulfadiazine is being prescribed orally.

METHODS OF PALPATION TO AVOID HAZARD FROM FLUOROSCOPY

To the Editor:—The danger of fluoroscopy, well known already, has been outlined again by Schatzki in the *New England Journal of Medicine*. He emphasizes that the palpating hand should never be in the direct beam of fluoroscopic light. How should that be avoided during the fluoroscopic study of the folds of the mucosa of the stomach and the bulbus of the duodenum and when the physician wants to use compression? Which device would be satisfactory to eliminate this danger without impairing the diagnostic value of the examination?

M.D., New York.

ANSWER.—The examiner should never have his hands in the direct beam between the tube and the patient—for instance, palpate the patient in the horizontal prone position—during fluoroscopy.

Palpation in the direct beam but on the side opposite the tube is obviously much less dangerous but still should be avoided whenever possible by the use of compression cones, wooden spoons and palpation outside the shutter opening. If palpation is practiced within the field outlined by the shutter, a lead glove should be used.

The examiner should never have his hands in the actual direct beam (between the tube and the patient) even if his hands are protected by lead gloves.